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1831

1934

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As the Editor Views the News

INDICATIONS point more definitely to the likelihood that the government administration will deal more harmoniously with industry in the near future. In spite of the fact the President's "fireside" talk was anything but reassuring on this point, the current of developments is forcing the administration to veer around to a more conciliatory attitude toward business. Some of the more sensible of the Presidents' advisers already see the light, and are trying to persuade him to modify his air of enmity. The Moley dinners at the Hotel Plaza, while not conclusive of a conservative trend, at least are encouraging. The talks of second-line administration spokesmen continue to be conciliatory in tone.

• • •

"Tammunism" Will Not Work

The cue for industry, under these circumstances, is to explain fully and carefully how it believes the new deal shall be modified to hasten recovery. At this stage more harm can be done by industrialists who damn the new deal with faint praise than by those who condemn it openly and bitterly. This is not to say that blind, carping criticism has value; it has not. But honest, constructive criticism at this time will help the public and the President to see that the present rule of "Tammunism" (p. 18) can lead only to state capitalism under a political dictatorship, and will harm rather than help the "average" man.

• • •

Have More To Sell

When Tom M. Girdler told the members of the American Society for Metals that the "steel industry has more to sell than it ever had to sell before," he was putting into words a fact that was demonstrated at the Sixteenth National Metal Exposition. Never before, to the knowledge of this writer, have the iron and steel producers displayed their wares as attractively as they did in the Port of Authority building last week. The entire show furnished evidence (p. 47) that producers of almost all forms of ferrous and nonferrous materials have more to offer than they did even a few years ago. The availability of new products and methods spells important new markets, the development of which will be an important factor in the next drive toward prosperity.

• • •

72,000 Men Saved!

One of the brightest chapters in the development of American industry is the fight against accidents, and in the front line trenches of this endless contest will be found the ranks of the iron and steel industry. Donald B. Gillies, president of Corrigan, McKinney, had a right to be proud when he told his audience at the National Safety congress (p. 52) of the pioneering work of the steel industry in the safety campaign. Most striking of his statements was that U. S. Steel in 27 years had reduced its serious and fatal accident rate 57 per cent, which "means that about 72,000 men were saved, to say nothing of their respective families." The winners in the annual safety contest (p. 53) show enviable records in accident prevention.

• • •

The Parade Is Endless

Progress in making, treating, fabricating and applying metals was reflected in the numerous technical discussions of last week's conventions. Interesting data on welding to withstand severe impact (p. 42) were presented to the American Welding society. Members of the Wire association were told about a new electrolytic process (p. 44) for cleaning metal. Members of all of the societies participating in the National Metal congress listened to the annual Edward deMille Campbell memorial lecture (p. 41), this year delivered by V. N. Krivobok on "Alloys of Iron and Chromium." The possibilities outlined by the author are inspiring. One can scarcely conceive of a subject more timely or better suited to the objectives of the memorial lecture than Fe-Cr alloys.

E. L. Shaner

Girdler Tells A. S. M. Record Steel Demand Approaches

STEEL buyers eager to go; replacement of existing steel-built equipment and maturing of new outlets expedited by specialty or "tailor-made" steels developed for the specific need; alloys sweeping on to new heights and opening up new markets!

Such was the picture painted with a broad brush by Tom M. Girdler, chairman and president of the Republic Steel Corp., in addressing the banquet of the American Society for Metals in New York Thursday. It was a prophecy that drew sustained and convincing applause from his 300 hearers.

But there was a reservation to Mr. Girdler's forecast. This glowing, bursting market for steel, he warned, is contingent upon restoration of confidence on the part of consumers, in turn hinging upon sound government policy. Such policy, he predicted, will emerge from the present period of trial and error.

Said Mr. Girdler in one of the strongest statements made in recent months by a steel executive:

Market Scarcely Tapped

In times like these, when financial uncertainty, economic experimenting, and labor unrest have all contributed to depress general business, nobody but an optimist would venture to discuss "Tomorrow's Markets for Steel."

Nevertheless, I am such an optimist.

In the face of all the discouraging elements in the present situation, I nevertheless believe and assert that thus far in the history of this country the potential markets for steel have merely been tapped.

I predict confidently that in the future—and the not too distant future—this country will be using steel in a thousand ways that have never been dreamed of before—and that before many years have passed we will see a total annual production of steel that will surpass anything in the history of the industry.

Now, I'm not saying this simply because I am an optimist by nature. Far from it. This prediction is based upon careful consideration of actual facts—facts that have been proved in our research laboratories, and tested out, from the standpoint of consumer acceptance, by salesmen in the field.

The steel industry has more to sell than it ever had to sell before. And potential buyers of steel were never in a more receptive mood to buy what the industry has to sell—*when, if and as they get the money to do it.*

How they will get the money remains to be seen. I will take up this side of the picture later. But, first of all, I want to tell you what the industry has to sell.

A long period of depression accomplishes some good. During the last four years the men in our research laboratories and the men in our sales departments have had plenty of time in which to study the possibilities of new types and new applications of steel, and to test many of these possibilities in actual practice.

The conclusion to be drawn from this experimenting is this—

Steel is no longer a standardized commodity, like sugar or wheat or coal.

We have entered into the age of specialized steels.

In the future all steels are going to be tailormade. In other words, steel is going to be manufactured to order, to fit the particular job for which it is designed.

The outstanding achievement of the industry in this direction has been the development and perfection of a whole series of alloy steels—each alloy having its own particular properties and uses.

This will mean that on top of the normal demand for steel, there will be an increased demand which will arise from necessity of replacing obsolete types of equipment by new equipment manufactured of steel specially adapted to that particular purpose.

Let me give you a specific example.

By the use of new alloys which combine increased strength with decreased weight, it is possible today to build a freight car which will weigh one-third less, and yet carry more tonnage, than the average car now in use.

This steel naturally costs more to produce than the old type. On the other hand, it would enable the railroads to make substantial reductions in operating costs.

Of course, today, railroads are not in a position to finance such purchases. And under the present car exchange arrangements, no one railroad is going to buy more efficient but higher priced cars when those cars might be used most of the time by some other road.

But in the long run, in some way—out of pure economic necessity—the railroads must, and will, take advantage of the savings in transportation costs made possible by new types of alloy steel.

This is not merely an academic discussion. In Chicago there is now in use a fleet of heavy duty trucks with bodies constructed of a new alloy steel made by our company. I mention this simply because it is an illustration with which I am familiar.

Greater Payload Possible

The steel used costs more per ton, but the amount of steel needed for the truck body is 40 per cent less in weight. Therefore, the total cost is only about 10 per cent greater. The new stronger and lighter steel has made it possible to increase substantially the loads per truck.

This increase in average load more than pays for the increased cost of the steel. These trucks are making from 10 to 15 trips a day, week after week, and proof of the new alloy has passed the experimental stage. If it can be done with trucks, it can be done with freight cars.

Now, our company is not alone in this sort of thing—this is typical of what can be done with new steels being produced throughout the industry.

What this may mean to the steel industry in future years is very simply told. There are some two million freight cars in use in the United States. Over 300,000 of them are over 25 years old, according to Joseph B. Eastman, co-ordinator of railroads. Their average age is 15.6 years.

Now, what is true of the railroads is almost equally true with almost every branch of industry which uses steel and steel products. The development of new alloy steels has opened up vast fields of replacement.

Take machine tools, for instance. The development of cemented tungsten carbide cutting tools has made possible higher cutting speeds and

STEEL'S PROPHET: Tom M. Girdler, heading up the third largest steel producing company, who foresees production topping all past records once the government removes the causes of present hesitation on the part of steel consumers

cutting of harder materials. These, in turn, require more strength and stability for the supporting structure of the machine tool.

New alloys give this strength and stability without adding unduly to the weight. Old machine tools may be serviceable—but they are obsolete. The necessity of cutting production costs to meet competition must inevitably, in the long run, produce a demand for machine tools constructed of new alloy steels.

Consider the aeroplane and dirigible field. For this use new steel alloys have been developed which have the capacity to withstand strains and stresses, in proportion to their weight, to a degree not equalled by any other materials.

The problem of resisting high temperatures has also been met by new alloy steels. For instance, in high duty engines the exhaust gases create extreme high temperatures. These require manifolds constructed of proper heat resisting materials. New steel alloys have been developed for this purpose.

Chromium alloys have been developed for heat-resisting purposes, particularly for cracking stills in the oil industry, where temperatures of from 900 to 1000 degrees are maintained for long periods. Similarly, new alloys have been developed for high pressure steam work, specially suited to use in superheated steam applications.

Refrigerators, Air-Conditioning

The electric refrigerator industry has meant much to the steel industry. Now there appears in the offing the possibility of application of the refrigerator principle to practically all types of building construction—that is, air conditioning. New types of iron, as well as new types of steel, have been developed for this particular purpose.

In future construction, it may well be possible that air-conditioning will be a standard factor—just as much so as central heating has been in the past. In addition, there is the prospect of the installation of air conditioning in a fair proportion of buildings already in existence. Here alone is an enormous potential market for iron and steel.

This leads naturally into a discussion of the possibilities of the steel house.

From the laboratory point of view, the steel house is past the experimental stage. We know that the use of steel in residence construction is practical both from a construction and cost standpoint.

A wide variety of materials is possible. Thus walls may be made of iron alloy sheets, steel alloy sheets, enameled steel sheets, or stainless steel superimposed upon some supporting material. Thus a broad range in style and appearance is obtainable.

The present problem with respect to the promotion of the steel house is not so much one of construction as it is one of public acceptance. Here a big job of education needs to be done—but the possibilities are enormous. Residential construction has been going down hill for about ten years. Meanwhile, population has been increasing. It is impossible to estimate the accumulated demand, but it must be very large. In 1928 residential building totaled $2,788,300,000. This gives you some idea of what the extensive use of steel in this field would mean to the steel industry.

Thus far I have merely touched upon stainless steel. It is in this field that steel has found almost limitless application.

You are all familiar with the use of stainless for external building trim, store fronts, and the like. You know of the use of stainless on modern passenger trains, such as the Burlington Zephyr—an entire train of stainless steel.

But these are merely "high spots" in the use of stainless.

Stainless is used for meat packing equipment, kitchen ware, dairy machinery, brewery equipment, dye and bleaching machinery, restaurant and hospital equipment, ice cream equipment, containers for beer, fruit juices and soft drinks, not to mention barrooms.

Then, of course, there is the whole range of household equipment—stainless furniture, stainless kitchen and dining room utensils, stainless cabinets and refrigerators—in fact, a whole stainless steel house, such as that exhibited at the Century of Progress in Chicago.

There appears to be literally no limit to the uses of which stainless steel may be put.

So, to sum up—

We may expect, in case general business conditions return to normal, the customary demand for steel, for usual structural, manufacturing and replacement purposes.

In addition, we may expect a substantial increased demand for steel due to the development of new special alloys and stainless.

Certainly these possibilities should mean eventually expanding operations and satisfactory profits.

But none of these possibilities will be realized, declared Mr. Girdler, "until the present state of doubt and uncertainty has been changed." These factors, he cited as restraining needed confidence:

> Failure of the administration to effect monetary stability;
>
> The hesitation with respect to long-term financing and distribution of investments;
>
> The labor situation.

Developing these points he said:

When business has some assurance as to what the dollar may be expected to be worth a year from now, then business may venture to plan a year ahead. But until that time, it will make no commitments except for immediate needs.

We cannot forever sit on the fence crying inflation for the benefit of those who owe money, and stabilization for the benefit of those to whom money is owed.

Which Way Is Question

I have no argument to make either in favor of inflation or against inflation. That isn't the point. The point is, which way are we going, and how far? I want to know what the government intends to do with my dollar. When I know that, I can plan accordingly.

I think that business should demand from the administration a concrete answer to that question.

In normal times, more than half steel used goes into durable goods.

Durable goods—including buildings, bridges, pipe lines, power houses, railway equipment, and broad programs of plant rehabilitation—are normally financed by bond issues, covering a period of time, distributed to the investing public.

In short, such projects require long-term financing through the sale of bonds or stocks.

This is as it should be. Commercial banks should not be expected to make long-term loans for capital purposes.

The administration recognizes this

A general view in the 1934 National Metal exposition in the Port of Authority building, New York, Oct. 1-5. Exhibits were arranged to provide easy inspection of exhibitor's products

fact, and admits the need of stimulation of the durable goods field. And yet the administration has adopted a policy which has proved extremely discouraging to loans to industry by private investors, of exactly the type needed to finance durable goods projects. . . .

In the over-zealous attempt of the administration to spread wages and afford relief to the unemployed, stockholders are being penalized beyond all measure.

These stockholders had no part in the abuses of capital which the government desires to correct, and they are getting little benefit from the relief of wage increase programs which the government is endeavoring to foster.

I doubt whether many people realize the number and extent of such stockholders. The ownership of the iron and steel industry, for instance, is divided among some 550,000 people. The vast majority of these stockholders are professional people, wage earners, merchants and teachers.

The country's millions of stockholders represent the backbone of economic stability. They have been through lean years and have been surprisingly patient. They have agreed that in the crisis through which we have passed wage earners should be taken care of first. They have even accepted without a murmur taxation to pay for the perpetuation of unemployment, the plowing under of cotton, and birth control among pigs.

All Hope Is Not Lost

Stockholders sooner or later will assert their rights—and the administration sooner or later must recognize such rights. . . .

Now, from a number of my remarks, you may have gotten the impression that I am entirely opposed to the new deal.

Such is far from the case. As I told you previously, the steel industry adopted new deal ideas with respect to wages and hours.

It has likewise adopted new deal principles with respect to its code, and it has found its code good business practice. I hope the steel industry will never return to cutthroat competition.

The steel code is in substance a practical working arrangement whereby unfair competitive practices are eliminated but nevertheless vigorous competition still exists, which keeps the industry in a healthy condition. In fact the code would represent sound business procedure whether there were any such thing as NRA or not.

The new deal may not be all right, but certaintly it is not all wrong. Personally, I am confident that out of the trial and error method which both business and the government have been using for the last year or so, there will emerge a solution to the worst of our difficulties, and that we will enter once more upon a period of returning prosperity.

When we have some assurance of monetary stability; when returning confidence has made possible more long-term financing; when the present wave of labor difficulties has subsided; I believe American business will enjoy a long period of increasing activity and satisfactory profits—profits in which the steel industry and its stockholders are bound to have a substantial share.

B. F. Shepherd
Newly elected president of the American Society for Metals

Interest High in Metal Congress

A SPLENDID attendance and intense interest marked the sixteenth annual National Metal congress and exposition held in New York last week, Oct. 1-5. During these five days hundreds of executives, metallurgists and engineers of the metal producing and working industries traveled from many parts of the country to participate in the programs arranged by five major technical societies. This was the first time the metal congress and show had been held in New York and the choice of this city seems to have been a popular one.

Originator and chief sponsor of the congress and exposition was the American Society for Metals. Cooperating in the program of technical meetings were the American Welding society, the Iron and Steel and Institute of Metals divisions of the American Institute of Mining and Metallurgical Engineers, the Wire association, and the Iron and Steel division of the American Society of Mechanical Engineers. Reflecting the somewhat improved business sentiment, all of these groups experienced considerably heavier registrations as compared with recent years.

The National Metal exposition, the largest in four years, was held in the Port of Authority building which offers unusual facilities for a show of this type; no previous exposition has been so adequately accommodated. Approximately 150 manufacturers displayed their products and services in the Commerce hall of this building. Nearly 25,000 people visited the exhibits during the five days. A description of the show appears on page 47 of this issue of STEEL.

Featuring the program of the American Society for Metals were ten technical sessions, the annual business meeting, a 5-period lecture course on tool steels, and the annual banquet. Reports of various technical sessions will be found on page 40 of this issue. A new feature for annual conventions of the society, the educational course on tool steels, conducted by J. P. Gill, chief metallurgist, Vanadium-Alloys Steel Co., Latrobe, Pa., attracted a registered attendance ranging between 150 and 200. Future conventions of the society probably will provide a wider range of educational courses.

Membership Holds

Officers of the society, presenting formal reports at the annual business meeting on Oct. 3, showed that during the past year, the organization has improved its position both as to membership and finances. Present membership is approximately 5500. This showing was considered remarkable in view of the depressed industrial situation. Of this total, about 2800 attended the congress.

New officers, nominated last spring, were declared elected and assumed their positions at the close of the convention. B. F. Shepherd, manager, rock drill division, Ingersoll-Rand Co., Phillipsburg, N. J., became the new president, succeeding W. H. Phillips, vice president, Molybdenum Corp. of America, Pittsburgh. R. S. Archer, chief metallurgist, Republic Steel Corp., Chicago, succeeded Mr. Shepherd as vice president. W. H. Eisenman, 7016 Euclid avenue, Cleveland, was named to succeed himself as secretary for a period of two years.

Two new trustees, elected for 2 years, are Walter Mathesius, assistant general superintendent, Illinois Steel Co., Chicago, and G. B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

The board for the coming year will comprise the new officers and trustees and the following: Trustee W. P. Woodside, vice president in charge of research, Climax Molybdenum Co., Detroit; Trustee E. C. Bain, research laboratories, United States Steel Corp., Kearny, N. J.; Past President Phillips; and Treasurer Emil Gathmann, president, Gathmann Engineering Co., Baltimore.

President Phillips announced that the R. M. Bird bell and gavel,

awarded anually to the chapter which has shown greatest progress and been of most service to the national society, would remain during the coming year in possession of the Cleveland chapter to which the award was made in 1933.

At the close of the annual meeting, Dr. V. N. Krivobok, professor of metallurgy, Carnegie Institute of Technology, Pittsburgh, presented the 1934 Campbell Memorial lecture on "Alloys of Iron and Chromium." Members of the American Institute of Mining and Metallurgical Engineers were guests of the A.S.M. for this lecture. An abstract of the Campbell lecture appears on page 41 of this issue.

The principal speaker at the banquet on Thursday evening, Oct. 4, was Tom M. Girdler, chairman of the board, Republic Steel Corp., Cleveland (See page 10). A guest of the society on this occasion was R. H. Watson, vice president, United States Steel Corp., New York.

First award of the society's recently established Albert Sauveur Achievement medal, for outstanding contributions to metallurgical knowledge, was made to Dr. Sauveur, Gordon McKay professor of metallurgy, Harvard University, Cambridge, Mass.

Research Work Honored

The Henry Marion Howe gold medal, for the best paper published in Transactions during the past year, was awarded to John Chipman, research engineer, University of Michigan, Ann Arbor, Mich. Dr. Chipman's paper, presented at the 1933 convention and entitled "Application of Thermodynamics to the Deoxidation of Liquid Steel," was published in the May, 1934, issue of *Transactions.*

The Past President's medal was tendered to W. B. Coleman, president, W. B. Coleman & Co., Philadelphia, president of the society in 1933.

Wire Association Reports Growth

PARTICIPATION in the discussions of the various papers presented at the fourth annual meeting of the Wire association held at Hotel New Yorker, Oct. 1-4, New York, and in conjunction with the National Metal Congress, was broader than at any time since the founding of the association. John Mordica, Bethlehem Steel Co., Sparrows Point, Md. in his address of welcome as president announced that the membership still is on the upgrade, thus evidencing the justification of the association.

At the first technical session U. C. Tainton, consulting metallurgical engineer, Baltimore, described a new process for the cleaning of metals which has many advantages over pickling and other cleaning methods. Under normal operating conditions a cost ranging from 25 to 50 cent per ton of metal cleaned can be expected. The new method now is being employed for cleaning wire at a Maryland plant. Details of the process are presented on page 44.

The manufacturer's committee on spools and reels met Oct. 2 to consider the approval of the proposed new standard sizes which have been reduced from 1000 to 32. The report of this committee will be presented in the November issue of *Wire and Wire Products.*

Registration included Paul L. Deutz, Cia Nacional de Clavos, S. A., Mexico City, Mexico, whose company manufactures nails and wire. "Mexico at present," stated Mr. Deutz, "is in better shape industrially than for many years."

W. E. Summerville, who developed the first wire rope making machinery in this country but who now operates a general store in Coal City, Ill., and engages in consulting practice whenever the occasion demands, also was in attendance.

E. J. P. Fisher was awarded the Wire association medal "for the most meritorious paper on the art of wire manufacture or fabrication during the year. His paper, presented at the final morning session, was entitled "Cold Drawn Steel Spring Wire."

Mr. Mordica was re-elected president. Vice presidents elected were L. D. Granger, Wickwire Spencer Steel Co., New York, and E. W. Clark, General Electric Co., Schenectady, N. Y. Richard E. Brown was re-elected secretary.

John Chipman

Research engineer, University of Michigan, Ann Arbor, Mich., who was awarded the Henry Marion Howe medal of the American Society for Metals at the National Metal Congress

Tells A.I.M.E. To Rout Fear

FEAR and uncertainty are obstructing business. We are on the brink of a prosperous era with a tremendous potential market for the output of the steel industry awaiting the day when these two undersirable forces can be dispelled.

That was the thought conveyed by L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., in a brief address at the annual dinner, Wednesday, night, of the Iron and Steel and Institute of Metals division of the A.I.M.E..

He encouraged business men to take a more active part in government and politics; to write their legislators concerning vital questions in an effort to remove the obstacles that are halting progress.

The keynote address of the evening was presented by Sam Tour, Lucius Pitkin Inc., New York. Die casting was his subject. Tracing the evolution of the industry from its inception, Mr. Tour reviewed the various problems that have confronted engineers and metallurgists, and how they have been overcome.

About 20 years ago, he explained, the "neck of the bottle" in the advancement of production of aluminum die castings was the lack of the satisfactory die steel. This need forced the die casting industry to go into an intensive study of alloy steels and in co-operation with the steel industry to produce alloy die steels in sizes unthought of before and in entirely new compositions. These steels although developed largely for the die casting field are finding uses in other lines.

Promising Future Seen for Welding

WELDING probably has not proceeded more than about 25 per cent along the path of its eventual development and application, in the opinion of Dr. D. S. Jacobus, president of the American Welding society, at the annual convention of that body, at the New Yorker hotel, New York, Oct. 1-4.

"Fusion welding is growing by leaps and by bounds and constantly is finding new applications," said Dr. Jacobus. "Five years ago there were no fusion-welded steam boilers for high pressure. Today practically all new high pressure and high duty boilers have fusion-welded drums."

One of the interesting features of the program was a conference under

auspices of the fundamental research committee at which research workers, identified with institutions of learning and with industrial companies, discussed details of their research programs and the methods by which they are proceeding.

To pave the way for revival of research activities of the national bureau of standards, Washington, the board of directors of the welding society adopted a resolution calling upon congress to appropriate more money for the maintenance of the standards bureau.

Want Codes Correlated

An important subject which received discussion by the board of directors was the confusion resulting from the fact that some 12 different societies are setting up codes containing welding provisions. The American Welding society proposes to make an effort as soon as possible to bring about a correlation of the welding sections of the various codes involved.

The intensification in interest in fusion welding, as well as the revival of industrial activity on an appreciable scale, were reflected in the attendance, which totaled 528. This compared with an attendance of around 200 at the annual conventions of 1933 and 1932. Reports of papers presented at early sessions appear on page 42.

In recognition of signal achievement in the development of electric welding apparatus and its applications, the American Welding society, Oct. 1, made the award of the Samuel Wylie Miller memorial medal to J. C. Lincoln, chairman, Lincoln Electric Co., Cleveland (for biographical sketch see p. 20).

This medal, a highly prized symbol of recognition in the field of welding, was initiated by the late S. W. Miller, Union Carbide & Carbon Research Laboratories Inc., who awarded it personally each year in recognition of meritorious achievement in advancing the art of welding. Following Mr. Miller's death, the society instituted annual award of the medal.

Foreign

A SMALL steel plant and rolling mill will be added to the existing blast furnace, pipe works and wood distillation plant of the Mysore state government at Bhadrazati, India. It is understood that the mill equipment will be supplied by German makers.

The existing development was designed and erected by Perin & Marshall, New York, now the Perin Engineering Co. The plant and furnace structure were built in the winters of 1922-23.

Labor

A TWO-MAN national steel labor relations board, minus the presence of Dr. James Mullenbach, sat in Pittsburgh from Tuesday to Friday to consider charges brought against employe representative setups in various steel plants, then adjourned for a ten-day period during which counsel will file briefs.

Charges of the Amalgamated Association of Iron, Steel and Tin Workers against the employe plan at the Duquesne works of the Carnegie Steel Co. were aired. The Amalgamated contended that company unions do not give the men the full right of collective bargaining, but this was denied both by the company and by counsel for the employe group. William J. Spang, of the Amalgamated, declared on the witness stand that " a greater spirit of unrest among the employes is caused by the company's refusal to agree on a new election, and that the situation in several mills has been extremely uneasy since mid-July."

Plan Designed by Expert

A. C. Cummings, general superintendent of the Duquesne works was one of the witnesses who denied that any attempt had been made by plant officials to influence the vote of the men at a recent election under the present system. Arthur H. Young, vice president of the United States Steel Corp., in charge of labor relations, also told the board that he had devised the representation plan now in effect in 165 mills of the Corporation, as a "legal vehicle for collective bargaining."

Somewhat similar charges were lodged by the Amalgamated against the employe plan in the McDonald, O., works of Carnegie, one point of the Amalgamated being that if the Upper Union, Ohio, and McDonald works votes had been separated the McDonald works would have rejected the revised plan. Carnegie officials maintained that all three mills are considered as one operating unit.

DENIES DISCRIMINATION

On Oct. 4, charges against Republic Steel Corp. at Warren, O., were brought up before the board. These charges were made against Republic Steel Corp., on the basis that men had been laid off because they refused to vote at the company union election in June. No charges were made against the adequacy of the company union type of representation.

However, the company took the position that there were 1600 men laid off at the works at that time, and that there was no discrimination.

A hearing involving the Jones & Laughlin Steel Corp., Pittsburgh, was postponed until Oct. 15, because Earl Reed, Jones & Laughlin counsel, was representing the Weirton Steel Co. in its action at Wilmington, Del. Amalgamated charges that Jones & Laughlin men at Aliquippa would be intimidated were discounted by Admiral Wiley.

During the Carnegie hearing, when counsel for the Steel Corp. challenged the authority of the board and indicated a test of its constitutionality and the majority rule for representation, Judge Stacy, chairman, invited a test.

¶ At Wilmington last week the department of justice renewed its case, seeking a permanent injunction to restrain the Weirton company from interfering with employes efforts to organize for collective bargaining. A temporary injunction was refused several months ago. The Weirton company has stood upon the election of last Dec. 15, in which employes favored their representation plan.

RICHBERG RECOGNIZES SMALL EMPLOYER IN BARGAINING

Donald R. Richberg, chairman of President Roosevelt's new policy-making commission, recognized the small employer, who may have to deal individually with his labor, in an address in Washington Thursday. He said:

"Individual bargaining has been regarded generally as an effort to break down labor organization. As the Supreme Court pointed out long ago, the individual is helpless in large establishments to do any bargaining for himself. Individual bargaining is a mockery in such instances.

"But this is a big country. There are thousands of employers in this country and they do not all employ 5000 men, and a law of the United States must be applicable to all. It must state a principle which can apply throughout industrial conditions if it is going to be applicable to them.

"There are thousands of employers of two, five, ten and 15 men in which the right of individual bargaining may be a very real right and of the very essence of tranquil relations. In such cases employers and employes may work out their problems together, and all may desire to be free from any outside control.

"Certainly if you are going to write down law, the statement of a right, you cannot look at it from the standpoint of the great industrial plants alone and say all individual bargaining is wrong, and bargaining must be only by large unit. You can only do just what 7a does, and that is leave to the men themselves the right to determine their own form of organization and representation free from coercion and then let the industrial relations be determined accordingly.

"That must necessarily mean that in some instances you will not have organized group bargaining, and you may have individual bargaining, which is the right of the individual under the constitution just as much as any other right of freedom of contract."

¶ National Association of Manufacturers is urging the President to de-

clare a truce on industrial warfare, during which the status quo of employment relations would be maintained; it challenged the American Federation of Labor likewise to agree to a truce, during which no attempt would be made to change existing relationships by force.

¶American Federation of Labor, in its annual convention at San Francisco last week, urged the national labor relations board, the steel labor board and others not to permit the names of company unions on ballots when the boards rule that such unions have been illegally initiated and fostered.

Transportation

CONCLUDING hearing of the railroads' case in support of their petition for increased freight rates and working in objections at approved session last week, the interstate commerce commission has adjourned the case until the latter part of October.

Testimony, presumably chiefly in opposition, will be taken from shippers and others at Denver, Oct. 26-27; Salt Lake City, Utah, Oct. 29-31; Portland, Oreg., Nov. 2-7; Birmingham, Ala., and Dallas, Tex., Nov. 7; San Francisco, Nov. 9 and 10 and possibly 12; Chicago, Nov. 16; and Washington, Nov. 26 until finished.

Principal steel industry witness last week against the increase was W. M. Lorenz, traffic manager, Otis Steel Co., Cleveland. He protested vigorously against the proposed rise in coal freight rates to Cleveland, the increase from Pittsburgh being 25 cents a ton or 13½ per cent, and from the No. 8 field of Ohio 25 cents a ton, or 14½ per cent. Likewise, he entered objection to advanving iron ore rates from the Marquette eastern range 25 per cent and from the Mesabi range 17½ per cent.

Supporting his contention, Mr. Lorenz quoted the commission as authority for the statement that the ore-carrying roads from the Minnesota ranges to Lake Superior ports are in a more prosperous condition than western carriers generally. He also pointed out that carriers hauling ore from the lower lake ports have not been so prosperous as upper lake carriers.

Republic Steel Corp., Youngstown Sheet & Tube Co., and Weirton Steel Co. are three steel producers signifying their desire to be heard on the proposed increases. The American Institute of Steel Construction, Independent Steel Fabricators Traffic association and the Institute of Scrap Iron and Steel also will appear.

¶Joseph B. Eastman, co-ordinator of transportation, proposed last week that the railroads set up a pool of freight cars to minimize empty hauls and reduce operating costs. A saving of $100,000,000 anually is visualized by him through the creation of two competing agencies of comparable traffic and financial strength, to be owned by the railroads which serve them, to handle all less-carload express and forwarder traffic.

Steel Code

BEFORE Oct. 10 rolls around, at which date regulation 9 to the iron and steel code becomes effective, it is expected that many independent steel fabricators will have registered loud protest over its provisions. Regulation 9, recently passed, provides that before a fabricator can obtain rate refunds under fabricated-in-transit clauses, he must present bills of lading covering the identified structure.

Last week the Independent Steel Fabricators Traffic association, Pittsburgh, advised its members over the country to register complaint with the interstate commerce commission. The Steel Plate Fabricators association, with headquarters at Chicago, likewise advised its members to protest regulation 9.

The attitude of the contestants to the operation of regulation 9 was best told in a circular letter sent out last week by the Independent Steel Fabricators Traffic association, Pittsburgh, to its members, which said:

"Manifestly, this regulation contemplates the same results as the 'ear-marking' of bills of lading proposed late last year, the only difference being that the steel companies propose to accomplish their purpose through the medium of invoicing rather than the railroad bill of lading provision, as previously contemplated.

Would Overcharge Fabricators

"The effects of such a regulation would be so revolutionary and far-reaching and would require the fabricators to pay large sums to the steel companies for stock material used, resulting in overcharges involving the rolling mills in fabrication-in-transit benefits which were granted by the railroads and the ICC to individual fabricators upon showing of justification and commercial necessity.

"It would localize and restrict small fabricators business and divert the transit benefits to the rolling mill-controlled fabricating shops located at basing points or within mill switching districts.

"We believe that individual fabricators and their trade associations should vigorously oppose this regulation and it is our view that all interested persons should immediately go on record with the principle rolling mill interests asking for postponement of the effective date of this regulation until a conference can be arranged between the different fabricator groups which handled the original 'ear-marking' resolution at Pittsburgh late last year on the subject of 'earmarking' of bills of lading."

¶Incidentally leading railroads,

CARNEGIE STEEL CO. BEFORE THE BAR OF THE LABOR BOARD: Steel officials and labor mingled freely in the federal court room in Pittsburgh last week when the national steel labor relations board took evidence on the petition of the Amalgamated Association of Iron, Steel and Tin Workers for the election of employe representatives for collective bargaining at Carnegie Steel Co. plants. In the front row, second from the left, is Arthur H. Young, vice president in charge of labor relations of the United States Steel Corp. Next to him is I. Lamont Hughes, president of the Carnegie company. Other officials shown include A. C. Cummings, general superintendent at the Duquesne plant of Carnegie; H. G. Bennett, assistant general superintendent at Duquesne; and N. J. Meek, employe representative at the Youngstown works of Carnegie. Wide World photo

through the Central Freight association, are asking that the delineation between sheets and plates, for the purposes of fabricated-in-transit allowances, be designated as No. 7 gage, instead of No. 16 gage as at present.

¶Jobbers on less-than-carlot sales of black and galvanized butt-weld pipe to buyers in California, Oregon or Washington may make deductions in the delivered prices not exceeding 25 per cent of the carlot prices, according to commercial resolution No. A-31, which became effective on Oct. 3.

JOBBERS MAY DEDUCT

Cold-rolled strip extras reclassifying products are being prepared for application Jan. 1. Meanwhile, to enable producers of narrow strip to compete on more even terms with the sheet mills for automotive business, new cold-strip commodity prices supplementary to extras now in effect have been filed with the American Iron and Steel institute, New York, the authority for the NRA iron and steel code.

New Capacity

YOUNGSTOWN SHEET & TUBE CO. is understood to be maturing plans for installing a cold-rolled strip mill to complement the wide strip-sheet mill which the Mesta Machine Co., Pittsburgh, is building for Sheet & Tube's Campbell works at Youngstown, O. The mill, costing between $300,000 and $500,000, will take the hot mill product and roll it down to No. 20 to 22 gage.

NRA

EXPECTATION that industries will be asked to eliminate price and production provisions from their codes was heightened Thursday when Donald R. Richberg chairman of the President's new policy making commission, urged industry to depart from "the lopsided guild socialism" of price fixing and production control in favor of "the old competitive system."

"An irridescent dream" was his characterization of the hope of industry that permanent prosperity could result from fixing prices and limiting production, although in emergency to prevent the waste of national resources, he conceded that such measures could be justified.

¶Amendment to the steel castings code to establish rules of fair trade practice for the manganese steel castings group has been approved.

MISSOURI SOUTHERN STATE?

NRA officials last week were pondering evidence submitted by representatives of 18 scrap interests in Missouri in support of their contention that Missouri be placed in the list of southern states under the waste materials trade code, thereby permitting a minimum wage of 27½ cents per hour for men and 22½ cents for women, or 5 cents less than in the North.

Benjamin Schwartz, New York, di-

(*Please turn to Page* 83)

Meetings

PLAIN Washer Manufacturers association will meet Oct. 15 at the Bismarck hotel, Chicago. The meeting will be open to all plain washer manufacturers, whether or not members of the association, according to Eugene Caldwell, secretary-treasurer, who is general manager of the Wrought Washer Mfg. Co., Milwaukee.

Ingot Rate Off Trifle in September

STEEL ingot production in September was off fractionally from August, the daily rate of 50,065 gross tons comparing with 50,495 tons in August. But compared with September a year ago, there is a decline from 87,811 tons. The September total of 1,251,630 tons brought the 9-month total for 1934 up to 20,268,462 tons, comparing with 17,189,390 tons in the like period of 1933 and just short of the aggregate of 22,594,079 for all 1933, says the American Iron and Steel institute.

Steel Ingot Production—1933-34—97.82 Per Cent of the Industry Reporting

Gross Tons

1933	Open-Hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approx. daily output all companies	Per cent operation
Jan.	885,663	109,000	994,663	1,016,870	26	39,110	17.99
Feb.	992,798	126,781	1,049,579	1,073,012	24	44,709	20.57
Mar.	784,111	94,509	878,620	898,236	27	33,268	15.30
Apr.	1,180,823	135,217	1,316,040	1,345,422	25	53,817	24.76
May	1,176,425	216,841	1,933,266	1,976,428	27	73,201	33.68
June	2,211,652	296,765	2,508,417	2,564,420	26	98,632	45.37
July	2,743,326	355,836	3,099,162	3,168,354	25	126,734	58.30
Aug.	2,430,663	370,370	2,801,033	2,863,569	27	106,058	48.79
Sept.	1,991,204	242,014	2,233,218	2,283,079	26	87,811	40.40
9 mo.	14,866,665	1,947,333	16,813,998	17,189,390	233	73,774	32.75
Oct.	1,847,690	191,673	2,039,363	2,084,894	26	80,188	36.89
Nov.	1,331,029	156,939	1,487,968	1,521,189	26	58,507	26.92
Dec.	1,629,495	129,834	1,759,329	1,798,606	25	71,944	33.19
Total	19,674,879	2,425,779	22,100,658	22,594,079	310	72,884	33.53
1934			**99.39 Per Cent of the Industry Reporting**				
Jan.	1,786,467	172,489	1,958,956	1,970,979	27	72,999	33.15
Feb.	1,993,638	175,873	2,169,511	2,182,826	24	90,951	41.31
Mar.	2,540,143	203,904	2,744,047	2,760,888	27	102,255	46.44
Apr.	2,622,372	257,482	2,879,854	2,897,529	25	115,901	52.64
May	3,000,624	331,620	3,332,244	3,352,695	27	124,174	56.39
June	2,714,983	282,592	2,997,575	3,015,972	26	115,999	52.68
July	1,343,732	119,869	1,463,601	1,472,584	25	58,903	26.75
Aug.	1,245,445	109,598	1,355,043	1,363,359	27	50,495	22.93
Sept.	1,126,415	117,580	1,243,995	1,251,630	25	50,065	22.74
9 mos.	18,373,819	1,771,007	20,144,826	20,268,462	233	86,989	39.51

Crucible and electric ingots not included. Percentages of operation for 1933 based on ingot capacity of 67,386,130 tons as of Dec. 31, 1932. Percentages for 1934 based on ingot capacity of 68,478,813 tons as of Dec. 31, 1933.

Production

STEEL production was in delicate balance last week. Increases at Pittsburgh, Youngstown, Wheeling and New England offset a sharp decline at Detroit, and held the rate at about 25 per cent, unchanged from the week previous. There seems to be a slight easing off in some districts which may pull the rate down fractionally this week. Details for various districts follow:

Youngstown—Climbed up 1 point to 29 per cent last week, and with two idle bessemers starting up this week, the rate is expected to pass 30 per cent.

Chicago — After dipping slightly below 26 per cent at the opening of last week, ingot production rose moderately above 26 per cent to close the week, resulting in practically no change from the average of the preceding week. Depending to a large extent on the daily volume of specifications, it is difficult for mills to set schedules far ahead, but only a slight change is in prospect this week. Eight of 36 steelworks blast furnaces continue active.

Wheeling — Advanced 2 points to 33 per cent last week, with 13 out of 39 open-hearth furnaces active in the district, a net gain of one open hearth. One local producer now has

6 of its 11 furnaces on; another, 5 of 12, and a third, 2 of 4.

Pittsburgh — Up 1 point to 18 per cent last week. A leading interest declined slightly to average 18-19 per cent, whereas, a leading independent advanced slightly last week to 20 per cent. Rates of some of the smaller independents show a tendency to ease this week.

Although Jones & Laughlin Steel Corp. blew in a second Eliza furnace last week, both of the furnaces of American Steel & Wire Co., at Donora, Pa., and the National Tube Co. at Monongahela works were banked, leaving a net loss of one for the district, making a total of 13 out of 60 blast furnaces operating. Seven of this total are being operated by Carnegie Steel Co., three by Jones & Laughlin Steel Corp., two by Cambria works of Bethlehem Steel Co., and one by Pittsburgh Crucible Co. at Midland, Pa.

Central eastern seaboard — Unchanged at around 17 per cent, operations showing little variation for more than a fortnight, and with little change indicated for this week. One eastern producer's steelmaking operations were suspended entirely last week, but one open-hearth is expected to be put on this week.

New England — Gained 9 points last week to 40 per cent, the most pronounced improvement since the upturn. Steelworks operating schedules for this week indicate operations will hold near this level.

Buffalo—Held at 24 per cent last week, with 9 out of 38 open hearths on. There is no sign of an early change in the situation here.

Birmingham — Unchanged at 25 per cent last week. Sufficient rolling in various mills held the rate at this level, although no improvement in demand for steel was reported.

Detroit — Down 18 points last week to 59 per cent, with only 10 of 17 open hearths active.

Cleveland-Lorain — Remained at 28 per cent last week. National Tube Co., Lorain, took off one open hearth, operating five, but Corrigan, McKinney Steel Co. added one, having four active. Otis Steel Co. continues with two. Finishing mill operations at Cleveland hold at 25 per cent.

AVERAGE DAILY PRODUCTION

	1934	1933	1932	1931
Jan.	39,537	18,348	31,336	55,337
Feb.	45,385	19,752	33,122	61,114
Mar.	52,438	17,484	31,194	65,448
Apr.	57,873	20,786	28,524	66,986
May	66,370	28,784	25,282	64,355
June	64,563	42,165	20,867	54,599
July	39,630	58,108	18,394	47,170
Aug.	34,199	59,137	17,035	41,264
Sept.	29,969	50,264	19,788	38,947
Oct.		43,824	20,795	37,831
Nov.		36,124	20,858	36,727
Dec.		38,456	17,650	31,625
Av.	47,767	36,223	23,699	50,035

September Pig Iron Output Off, but 9-Month Total Leads

DESPITE another severe recession in September, when the daily rate declined 12.4 per cent, pig iron production for the first nine months of 1934 retained a wide margin over the corresponding periods of 1933 and 1932 and almost equalled 1931.

Total production of 899,075 tons in September brought the figure for the first nine months of 1934 up to 13,040,414 tons, an increase of 3,453,123 tons or 36.1 per cent over the 9,587,291 tons produced in the corresponding period of 1933. Production in the 9-month period of 1932 was 6,856,487 tons and in 1931, 15,988,003 tons.

Average daily production in September dropped to 29,969 tons, a loss of 4230 tons or 12.4 per cent, from the 34,199 tons of August. As was the case last month, this was the smallest output since May of 1933 with 28,784 tons daily. In September, 1933, daily production aggregated 50,264 tons.

As a result of this decline, September was the fourth consecutive month to show a loss, the August output having dropped from 39,630 tons in July, and the July rate from 64,563 tons in June.

Relating production to capacity, the operating rate for September was 21.5 per cent, as compared with 24.5 per cent in August, 28.4 per cent in July and 46.3 per cent in June.

The lighting of one merchant and five steelworks stacks offset the blowing out of six steelworks stacks, leaving the number active Sept. 30 unchanged at 61.

With an equal number of furnaces producing iron in September as in August, this was the smallest number since May, 1933, also having 61. In September of last year, there were 89 furnaces in blast.

During the past month, six furnaces were blown out or banked and six were blown in. Of this number, six nonmerchant or steelworks were blown out and five went in. Of the merchant class, one was blown in.

Following is a list of furnaces blown out or banked during September: Ohio: Haselton No. 5, Republic Steel Corp.; Mingo No. 2, Carnegie Steel Co.; Pennsylvania: Donora, American Steel & Wire Co.; Swede, Alan Wood Steel Co.; Monongahela No. 1, National Tube Co.; Michigan: Detroit A, National Steel Corp.

Furnaces blown in during September were: Ohio: Lorain No. 5, National Tube Co.; Haselton No. 5, Republic Steel Corp.; Mingo No. 4, Carnegie Steel Co.; Jisco, Jackson Iron & Steel Co.; Pennsylvania: Cambria H, Bethlehem Steel Co.; New York: Donner No. 2, Republic Steel Corp.

RATE OF OPERATIONS

(Relation of Production to Capacity)

	1934[1]	1933[2]	1932[3]	1931[4]
Jan.	28.3	13.3	22.1	38.4
Feb.	32.5	14.3	23.4	42.5
Mar.	37.5	12.7	22.0	45.4
Apr.	41.4	15.1	20.2	46.5
May	47.5	20.9	17.9	44.7
June	46.3	30.6	14.7	37.9
July	28.4	42.4	13.0	32.7
Aug.	24.5	42.8	12.0	28.7
Sept.	21.5	36.4	14.0	27.0
Oct.		31.8	14.7	26.3
Nov.		26.2	14.7	25.5
Dec.		27.9	12.5	22.0

[1]Based on capacity of 50,975,561 gross tons, Dec. 31, 1933; [2]on capacity of 50,313,975 tons, Dec. 31, 1932; [3]on capacity of 51,598,175 tons; [4]on capacity of 52,515,875 tons. Capacities by American Iron and Steel institute.

SEPTEMBER IRON PRODUCTION

	No. in blast last day of month		Total tonnage Merchant	Nonmerchant
	Sept.	Aug.		
Ohio	13	11	32,036	171,380
Penna.	18	20	29,525*	246,086*
Alabama	5	5	33,385*	22,561
Illinois	5	5	30,835	53,138
New York	6	5	46,072	22,062
Colorado	1	1		
Indiana	5	5	1,262	130,266
Maryland	2	2		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1	8,754	71,713
West Va.	1	1		
Michigan	3	4		
Minnesota	0	0		
Missouri	0	0		
Total	61	61	181,869*	717,206

*Includes ferro and spiegeleisen.

MONTHLY IRON PRODUCTION

	1934	1933	1932
Jan.	1,225,643	568,785	971,437
Feb.	1,270,792	553,067	960,550
Mar.	1,625,588	542,013	967,015
Apr.	1,736,217	623,606	855,734
May	2,057,471	892,326	783,769
June	1,936,897	1,264,953	626,015
July	1,228,544	1,801,345	570,222
Aug.	1,060,187	1,833,265	528,105
Sept.	899,075	1,507,931	953,640
9 mo.	13,040,414	9,587,291	6,856,487
Oct.		1,358,540	644,648
Nov.		1,083,740	625,753
Dec.		1,192,136	547,179
Total		13,221,707	8,674,067

Machine Tool Builders Scan Probabilities in NRA Changes

PROBLEMS of the relations between government and industry dominated the discussions at the thirty-third annual convention of the National Machine Tool Builders' association, held Oct. 1-3 at Hotel Traymore, Atlantic City, N. J.

The convention adopted unanimously a resolution endorsing the report submitted in May to President Roosevelt by the durable goods industries committee. It elected three new directors and new officers, as listed elsewhere on this page. The association announced that it will hold a machine tool exposition in Cleveland during the month of September, 1935, the exact date to be named later.

Dr. Virgil Jordan, president, National Industrial Conference board, New York, delivered an address entitled "The Road Map of Recovery for 1935" following the formal dinner Tuesday evening. Doctor Jordan pointed out that while in ordinary times the course of business could be observed by its ups and downs, today it is necessary to consider another dimension—whether the course leads to the right or left. The present road, he declared, leads only to one end, which is state capitalism under political dictatorship.

Ruled by "Tammunism"

In proof on this contention, he retraced the events in government administration during the past 18 months. He stated that the government is being run on the principles of "Tammunism," in which the method of government is adapted from Tammany and the economic policies are borrowed from Communism.

Government under these doctrines implies the destruction of industries such as the machine tool building industry, reduces profits of private enterprise, introduces the government into competition with business, encourages unionization and results in retarding rather than stimulating recovery.

The decision as to whether we will continue on the road to state capitalism or whether we will turn right at the next crossroad now hangs in the balance, said the speaker, who added, encouragingly, that the "chances seem better than at any time in 18 months that we will turn off that road and try another."

Doctor Jordan discussed some of the problems involved in turning to the right at this time, and declared that the opportunity may come to industry to join hands with the government in a move to the right. He expressed the belief that if the administration can win business confidence and in turn can count on the support of business, then it may try to avoid the old road. "The great danger," he said, "lies in passing the crossroad without turning off."

Charles J. Stilwell, vice president, the Warner & Swasey Co., Cleveland, presided at the final session on Wednesday. Referring to a recent visit to England, he said he was impressed by the important advances made in the design of British machine tools.

Alfred E. Drissner, vice president and chief engineer, National Acme Co., Cleveland, reported on his recent observations on conditions in England, Sweden, Germany, France, Switzerland and Italy. An abstract of his observations will be published in next week's issue.

Howard W. Dunbar, manager, grinding machine division, Norton Co., Worcester, Mass, described an interesting development in the training of apprentices. He explained that the system adopted by the Norton Co. The new course is for 18 months only. The boy in training is assigned to one department only. After the working day he is given classroom instruction. Before the course is completed he is allowed to spend some time in all departments, but the object of the course is to train specialists.

Boys are paid 25 cents per hour plus 3 cents per hour for each successive 15-week period until the wage is brought up to 40 cents per hour. The applicants must be 16 years of age; 18 is a preferable age. They must have a grammar school or equivalent education, be mechanically inclined and present a good appearance.

How Will NRA Be Changed?

In the opening session on Wednesday, Edward A. Muller, president, King Machine Tool Co., and president of the association, spoke briefly upon the relations of the machine tool industry with the government during the past 18 months.

Herman H. Lind, general manager of the association, discussed conditions which probably will be faced by industry during the remaining life of NRA and immediately thereafter.

"Industry is not safe in planning its future with the expectation that all features of NIRA will be eliminated," he said. "It is faced with making its plans subject to the retention of the recovery act, or something comparable, and to considering what provisions are likely to remain."

Mr. Lind declared that consensus of opinion today would indicate that the labor provisions take the first place in probability of survival—surely some type of collective bargaining, that minimum wage is certain to remain and that maximum hours will undoubtedly stay in some form.

"In our industry," he said, "which is so dependent on skilled workmen, limitation of hours and restriction of flexibility of plant operation will bring almost insurmountable obstacles in operation when recovery returns. In this industry there is an apparent shortage of approximately 35 per cent of skilled workmen as compared with 1929, and there was no surplus then.

"The 40-hour week is quite general. It represents a cut in hours of more than 20 per cent. Industry has not digested nor made practical that shortening of hours; it has had no opportunity to do so and to go further would not only throw insuperable difficulties upon industry but would make it impossible to maintain the present standard of living. Reasonable and intelligent flexibility of hours of work are an absolute necessity if efficient plant operation is to continue.

"It is evident to this industry that the shortage of skilled workmen which will be brought about by any

New Officers, Directors of N. M. T. B. A.

President

CHARLES J. STILWELL

Vice president, The Warner & Swasey Co., Cleveland

First Vice President

NORMAN D. MACLEOD

President and general manager, Abrasive Machine Tool Co., East Providence, R. I.

Second Vice President

CLAYTON R. BURT

President and general manager, Pratt & Whitney Co., Hartford, Conn.

Treasurer

HUBERT H. PEASE

President New Britain-Gridley Machine Co., New Britain, Conn.

New Directors

CLAYTON R. BURT

EUGENE C. CLARKE

President, Chambersburg Engineering Co., Chambersburg, Pa.

HENRY C. PIERLE

Secretary and sales manager, The R. K. LeBlond Machine Tool Co., Cincinnati

reasonable recovery will very immediately become acute. There probably is no other matter that is so deserving of the immediate consideration, action and planning on the part of the individual units. Undoubtedly some of the workmen who have left the industry will be back when they have assurance of a steady job, but this will not be nearly enough. Plans for training men must be ready to be put into operation the moment it is possible."

Mr. Lind pointed out that higher wages and shorter hours make necessary cost saving equipment wherever it can be used. That this is taking hold is well illustrated, he said, by sales in the industry this summer. Sales of machine tools in August increased 20 per cent over July sales, while the general indices of business dropped in that month. An analysis discloses that 53 per cent of the companies in the machine tool industry increased their business.

Pleads for Open Prices

The speaker emphasized the importance of open, firm prices. He said:

"Price fixing between competitors except possibly at times in natural resource industries cannot be supported either from an economic standpoint or from the standpoint of practical operation. Where price fixing is practiced and is made to work it is very liable to ruin an industry. People do not seem to understand that the open price is a price established by an individual enterprise which then becomes that enterprise's *one* and *only* price to all customers. While this policy was adopted years ago by mercantile establishments as a matter of fairness to their own customers, these same establishments constantly are attacking the open price policy established by industries from whom they buy. The real reason for this attack is that they wish to maintain the practice of negotiating beween competitors for secret prices and conditions. This industry, so well grounded in the fundamental justice and fairness of the open-price, one-price, firm-price policy, should advocate it everywhere as the proper sales policy."

Referring to bans on new capacity, Mr. Lind pointed out that some of the codes provide for restrictions of new equipment and restriction against expansion except as it may be subject to approval of code authorities and the administrator. "Provisions of this type certainly should not be included in any form," he said. "New methods, new processes, throwing out of the inefficient and the wasteful, is demanded if progress is to be made. If a man has a better idea for a low cost production, no legal obstacle or difficulty should be put in his path. However, there should be available to him the statistics of the industry showing the true condition existing as to capacities and the competitive situation in the market. With this picture available to those willing to invest their money, it is their right and their privilege, and in the public interest, for them to be able to go forward. Otherwise whole industries using obsolete equipment and practicing inefficient methods would remain in that condition indefinitely, contrary to all fundamental principles of progress.

Builders Endorse Unanimously Report of Durable Goods Industries Committee

MEETING of the machine tool and forging machinery industry was held Tuesday morning. Henry Buker, vice president, Brown & Sharpe Mfg. Co., Providence, R. I., chairman of the supervisory agency (code authority), presided.

Mr. Buker presented a brief report of the agency's work, commenting particularly on problems encountered in the administration of the industry's code. He emphasized the unfortunate effect of President Roosevelt's executive order permitting reduced prices on government work. Commenting, he said:

"One order that affects the industry . . . deeply is Executive Order No. 6767, permitting a reduction up to 15 per cent from listed prices on bids made to any branch of the government, provided copy of the bid is filed with the code authority on the opening day. This order strikes at the root of the firm-price policy which years of experience, dating back to the beginning of the industry, have proven to be the only sound policy for selling machine tools. The supervisory agency lost no time in transmitting a strong protest to General Johnson. This order is unfair in that it sanctions discrimination between customers and will lead to progressive price cutting from prices already too low to restore the industry to a healthy condition."

In conclusion he urged every member to use his influence to safeguard the interest of the industry as far as possible. "We should do everything we possibly can to urge the government to take a more helpful attitude toward business."

Frida F. Selbert, treasurer of the supervisory agency, reported upon the cost of code administration. Herman H. Lind, executive officer of the agency, spoke briefly on several phases of the functioning of the code. He reported that only 29 complaints had been formally submitted and that most of these were due to misunderstandings which were cleared away when the facts were made known to all parties concerned.

Robert M. Gaylord, president, Ingersoll Milling Machine Co., Rockford, Ill., the association's representative to the Machinery and Allied Products institute, reported briefly upon the meeting of the durable goods industries held recently at Hot Springs, Va. At the conclusion of this report, he introduced George H. Houston, president, Baldwin Locomotive Works, Philadelphia, and chairman of the durable goods industries committee.

Mr. Houston outlined the work of that committee and emphasized the similarity of its objectives with those of the machine tool and forging machinery industry. Mr. Houston's remarks prompted the convention to adopt the following resolution endorsing the report of the durable goods industries committee which was submitted to President Roosevelt on May 14:

"We, the members of National Machine Tool Builders' association, assembled in our 33rd annual convention, affirm our conviction that national recovery can only be brought about by re-employment in the durable goods industries.

"The people of a nation can have no more than they produce. As makers of the basic machines for production, the members of this association emphasize the fact that the standard of living of a nation is measured by its effective use of machinery. Nowhere else in the world is machinery utilized to the extent that it is the United States; nowhere else does the average man enjoy as many conveniences and comforts. Witness the 23,000,000 automobiles, the 19,000,000 telephones, the more than 5,000,000 automatic refrigerators, the millions of radios and the countless other products which the efficiency of the machine has put within reach of the average man—products which are luxuries in other countries.

"Because of these basic and generally known facts the National Machine Tool Builders association by formal resolution hereby endorses the report to the President of the United States on national recovery and employment presented by the durable goods committee on May 14, 1934.

"We recommend to the President and to congress, and to the recovery administration the most serious consideration of this report and especially the fundamental conditions necessary to recovery and re-employment stated therein. To these fundamentals for the attainment of the best interest of the greatest number we heartily subscribe."

Industrial Men in the Day's News

John Cromwell Lincoln, Recipient of Samuel Wylie Miller Medal of American Welding Society

An early co-worker with Charles F. Brush, he has devoted most of his life to study of the electric arc.

His company since 1907 has pioneered in the development of arc welded steel construction.

A notable achievement which he directed was the introduction in 1929 of the shielded arc for welding.

JOHN CROMWELL LINCOLN, chairman of the board of Lincoln Electric Co., Cleveland, who was awarded the Samuel Wylie Miller medal of the American Welding society, Oct. 1, is a pioneer in the field of arc welding and has devoted most of his life to research and development of the electric arc as an industrial tool.

Born July 17, 1866, in Painesville, O., Mr. Lincoln received his elementary education there, after which he attended Ohio State university and received a degree in electrical engineering.

Joining the staff of Charles F. Brush, inventor of the arc light, in 1888, he early gained experience with the phenomena of the electric arc. Later he became affiliated with the Elliott-Lincoln Electric Co., a pioneer manufacturer of electric motors. In 1896 with this company as a nucleus, he formed the present Lincoln Electric Co.

Under his direction this company produced in 1907 the first variable voltage arc welding machine. Two years later as a direct result of Mr. Lincoln's efforts, the first redesign of a cast iron product for arc welded steel construction was made.

In 1916 Mr. Lincoln was the first to carry the electric arc into the structural field, where he directed the application of the process in the remodeling of an industrial structure.

A year later, in conjunction with the government, he established the first school for training welding operators. His company has conducted this school continuously since that time, and has given thorough instruction to many thousands of students in the application of the process.

Still another contribution to the ever-broadening field of application of arc welding was made in 1919 by Mr. Lincoln when the first motor was completely redesigned from cast iron to arc welded steel construction.

What is considered the greatest single advance in the art of welding was effected under Mr. Lincoln's direction in 1929 when his company introduced the first practical shielded arc for general industrial use. This greatly increased welding speeds and resulted in vastly improved physical properties of weld metal.

Since he introduced the first variable voltage arc welding machine for the repair of faulty castings, Mr. Lincoln has seen the results of his numerous inventions in this field achieve a prominent position in the fabrication and maintenance of metal products.

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Ralph E. Cressy has been appointed sales manager for a new division of heating units which will be manufactured by the Fedders Mfg. Co., Buffalo.

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E. W. Lawrence, for the past 11 years in the New York sales office of the Norma-Hoffmann Bearings Corp., Stamford, Conn., has been appointed southern representative for the company.

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R. C. Rudolph has been appointed auditor of the American Sheet & Tin Plate Co., Pittsburgh, succeeding Rolland J. Hadly. M. D. Wells and R. C. Cochran have been appointed assistant auditors.

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Edward J. Greene, with the Baldwin-Duckworth Chain Corp., Springfield, Mass., since 1927, has been appointed assistant treasurer of the corporation. He had formerly been with the Corbin Motor Vehicle Co., New Britain, Conn.

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Col. Joseph Ruxton, chairman of the board of Ruston-Hornsby Ltd., Lincoln, Eng., and vice chairman of Ruston-Bucyrus Ltd., affiliate of the Bucyrus-Erie Co., South Milwaukee, Wis., is visiting the South Milwaukee works and general offices of the company.

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Frank Kelly, formerly traffic manager of United States Steel Products Corp. and American Steel Export Co., has been appointed manager of the order and traffic department of Otto Kafka Inc., New York.

W. C. Hays and C. H. Brushaber were appointed vice presidents.

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Algernon L. Smith, Birmingham, Ala., has been elected president of the Continental Gin Co., manufacturer of cotton gins. The company has plants at Birmingham, Prattville, Ala., Dallas, Tex., Memphis, Tenn., and Atlanta, Ga. Mr. Smith has been vice president of the company for several years.

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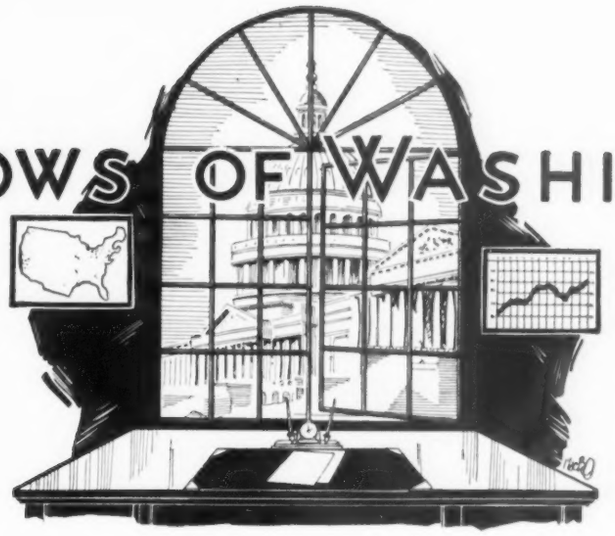
E. J. P. Fisher, physical metallurgist, Keystone Steel & Wire Co., Peoria, Ill., who was named the first recipient of the Wire association medal at the meeting of this group in New York last week, is a graduate of Worcester Polytechnic institute. He pursued graduate work in metallurgy at the school of mines, Columbia university, and from 1922 to 1929 was associated with the General Electric Co., R. Wallace & Sons Mfg. Co., Carpenter Steel Co. and the Diamond Chain & Mfg. Co. He then became physical metallurgist with the Keystone company and at present is in charge of the metallographic and physical testing departments, also directing research and development work in high-carbon steels.

WINDOWS OF WASHINGTON



WASHINGTON

TWO weeks ago this department recounted a number of developments in government policy, chiefly the outcome of weakness in the bond market, which lent support to the wishful thinking that the administration finally was turning to the right. Happily, there was this qualification:

> "In the past it has invariably developed that there has been no important deviation from the social reform objectives of the new deal, and optimism has quickly died. It remains to be seen whether last week's veering was merely another series of concessions or a basic change. Only time can determine that."

THUMPS TO THE LEFT

A fortnight was all that was necessary. The President—a thoroughly disturbed President repeatedly thumping his desk as he talked—made it perfectly clear in his fireside radio address Sept. 30 that on fundamentals he is not turning to the right; if anything, he will explore the road to the left a little further.

It is important for steel, as for other industries, to fathom the thinking in Washington at this time. Incidentally, the lesser new dealers are taking their cue from the White House and are displaying increasing irritation at frank consideration of government policy. Briefly, the administration's thinking is:

> Industry, along with capital, is on strike against the government. Any diminution of business and the mounting relief rolls—estimated to reach a peak of 20,000,000 persons this winter—are due not to the new deal but to industry's resistance to it. If industry can be forced to accept the new deal, nothing more matters.

Recovery is settling down to a contest between industry and the government, and the government is bound to win, first, because industry has proved itself to be inept; second, the new deal is fundamentally right; the incoming congress will be more radical; fourth, pentup demand is bound to break down any artificial hindrance, and a measure of recovery is inevitable regardless of industry's defiance of the new deal.

That, understand, is the present thinking in Washington. It indicates a defensive attitude, for the fact is inescapable that despite all federal aid the necessity for individual relief is increasing. It evidences a stubborness, of which the best example is the President's unwillingness to take a stand now on balancing the budget and stabilization of the currency.

It denotes a punitive attitude toward business and industry, typified by the attack on the banks despite the fact they have become warehouses for government bonds financing the new deal. It also warns industry that notwithstanding comforting assurances by officials as high as the cabinet, the President is unswerving and no statement by any lesser light counts.

VOTERS UNDISTURBED

Every primary or election vote this fall, in Maine, Louisiana, Mississippi, California, Massachusetts and elsewhere indicates that new deal policies continue popular with the masses. The President weighs on the one hand this popular approbation, wherein every laborer casts a vote of equal value with a captain of industry, and pressure from organized industry for more than word-assurance of a fair profit for it. The depression has become a political one.

Nor can steel and other industries overlook the character of the personnel of the new brain trust, as the recently-appointed policy committee headed by Donald R. Richberg is being termed. While Mr. Richberg is more acceptable to industry than he was a year ago, he has persistently declared for stripping codes of all pricing provisions—and iron and steel producers realize what their code would be with nothing but wage, hour and trade practice clauses remaining.

REFORMERS ARE READY

Then there is Secretary of Labor Perkins, who would load up industry with unemployment insurance, old age pensions and divert to labor all but the thinnest veener of profits. Also Secretary of the Interior Ickes, an outspoken foe of uniform prices. And Harry Hopkins, relief administrator who said following the Sinclair victory in California that "we won," and Chester C. Davis, coworker with Head Braintruster Tugwell and now administering AAA.

This group—Richberg, Perkins, Ickes, Hopkins and Davis—will have prime influence in shaping up a legislative program for the coming congress, designed to perpetuate NRA and AAA in some form, also to initiate unemployment insurance, old age pensions and other special reforms visioned by the new deal.

SURPRISINGLY often is the subject of steel prices broached in Washington, and frequently in connection with abrogation of the price provisions of the steel code.

The navy department, which is coming to the front as a buyer of steel for 13 warships to be built in navy yards and which has an equally large program shaping up for next year, is restive both under the current level of prices and at having to draw successful bidders' names out of a hat.

Naval officers take the position that there is no such thing as a code price for steel. While the code per-

mits the filing of prices it does not necessarily follow that any prices so filed must be accepted as official, they maintain.

Navy discipline prevents any criticism of present prices, but it goes without saying that lower quotations would enable the department to make a better showing, and the donning of a uniform does not change the buying instinct of a man.

When variations in navy bids do occur they usually are the result of an accident, as for instance figuring the discount on the delivered price instead of deducting the freight and basing the discount only on the tonnage involved.

Some economists in government service are yet unconvinced, despite the sorry financial showing of producers since 1929, that the solution is lower prices. To them it is a basic law that volume must be created before prices making that volume profitable are warranted.

URGE RATIONALIZATION

They point to bars, plates and shapes at 1.80c, Pittsburgh, today compared with 1.60c when the code took effect, also that black sheets have been advanced from 2.25c to 2.40c, and pig iron at Cleveland from $16.50 a ton to $18.50, just to cite four examples. In the meantime, volume today is lower than it was last August.

These economists reason that present prices are unremunerative because they are loaded with the overhead of equipment that is obsolete or probably will never again be in great demand. They point to the trend toward special steels and the lighter forms of steel, taking account of the American Iron and Steel institute's analysis showing that in the first half of 1934 heavy shape capacity was engaged only 23.6 per cent, plates 23.9, rails 27.8, buttweld pipe 28.5 and lapweld pipe 19.5, whereas black plate capacity was operated at 84.6 per cent of capacity, tin plate 61.9, all sheets 61.4, hot strip 52.7, and cold strip 49.4.

In other words, rationalization of the steel industry through writing off surplus or obsolete capacity is held up as the remedy. In this attitude Washington has some support from steel's biggest customer—the automobile industry—which continues to prod for lower prices, supports agitation for a Detroit base on steel, and points to the improved market for automobiles developed when price increases were rescinded last spring.

Even the shade of Judge Gary is invoked to support the theory of a low-price economy, it being maintained by some in Washington that were the Judge alive he would slash the price of steel in half, and then begin working prices up to a remunerative basis after he had attained volume.

NRA is mindful of the fact that the steel code authority has not disposed of the contention of Mississippi valley consumers that delivered prices be computed on an all-water basis where barge transportation is available. Incidentally, the new post for Mr. Richberg is likely to compel him to step off the code authority.

Federal trade commissioners may break out any week now with two reports—one on basing points, and the other on the complaint of Birmingham steel consumers against the $3 per ton differential charged at Birmingham over Pittsburgh. In regard to the first, the trade commission will not be satisfied until every producing point is a base. As to the second, to adjust the complaint at Birmingham would necessitate the commission lowering the differential or, in other words, fixing prices.

IT IS extraordinary for a President to announce on a Sunday night that he will shortly inaugurate informal conferences calculated to establish a truce between capital and labor, and at noon the following Monday explain that he did not mean that either side must lay down its weapons—which in the case of labor is the right to strike.

But Mr. Roosevelt did precisely that a week ago, and he thereby evidenced the apprehension concerning labor which is gripping the administration. This fear may have been in the background of his plainly defensive position in making his fireside radio address.

It appears that the gentle lion cub which the administration fondled in the spring of 1933 in writing the collective bargaining provisions into the recovery act is now a terrifying beast, the more ferocious because it has tasted the blood of General Johnson.

Out in San Francisco is the American Federation of Labor in convention, offering a sounding board for its truculent mood, which was manifested by its effort to intimidate every candidate for congress into declaring for a 30-hour work week.

Less than a month distant is election day. Although trouble in the textile industry has been quelled for the time being, steel and automobile labor is a shade more restive, and industry through the Houde case is challenging the authority of the new labor board.

It is difficult to pin down this concern over steel labor. The only sore spots are a few that have been created by the Amalgamated association. A genuinely brisk fall upturn, with mills pressed to make deliveries, would create an opportunity for the Amalgamated to prove troublesome, but the occasion is not presented now, and apparently will not be.

Likewise, employment in the automobile industry is easing off toward the low point of the year, just prior to a start on 1935 models. But in the first week of November, just a few days before election, the labor issue will become pertinent as extension of the code comes up. The automobile code, it will be recalled, specifies proportional representation of labor. The new administration policy is majority representation.

In the case of steel, the steel labor relations board specified majority rule following the West Virginia Rail Co. election last month, but this has never been promulgated as an official policy. In setting up a textile board, drafting the steel board for this purpose, the President referred to majority rule, with the usual qualification that minorities were not to be denied the right of protest.

WHAT TO DO ON AUTO CODE?

This textile order, dated Sept. 26, is the first ruling on majority rule to emanate from the White House. When the automobile code is considered in several weeks, the President will be squarely confronted by the issue, and it is a safe forecast that if he attempts to impose majority rule, favored by the A. F. of L., on automobile manufacturers they will throw up their code.

In event these informal conferences looking to truces are called, it will be interesting to watch in the case of steel what policy will be adopted in regard to representation of labor. Would steel producers come to Washington and discuss a truce with Amalgamated leaders whom they have not recognized in their own plants for the reason they represent only a small minority of workers?

WASHINGTON NOTES

NRA still was on dead center last week. The suspense over the future of General Johnson and his faction was over, but it will be next Monday before the new advisory board headed by S. Clay Williams, tobacco magnate, takes hold. Even those sympathetic with its aims concede that NRA's day is past.

Few leave-takings have been so dramatic as that of General Johnson from NRA on Oct. 1. His staff gathered around him, both Columbia and National had hookups, only the industrialists upon whom he cracked down in sulphurous language were missing. The general quoted the Sermon on the Mount, the Golden Rule, Madame Butterfly, and concluded with probably the best known benediction, "The Lord bless thee and keep thee . . . ." Tears were plentiful, even coursing down the general's rugged cheeks.

The report is going around that the next congress will set up two billions for public works. This is an-

(*Please turn to Page* 24)

DETROIT

CHRYSLER apparently intends to get the jump on its principal competitors in the introduction of new models. Production of 1934 cars was completed last week by Chrysler, Plymouth and DeSoto, and after a short interval operations on new models will be commenced.

While it is hoped to start the new schedules by the middle of October, there is some possibility that the date will be delayed until late this month or early November. Releases have been issued for certain steel requirements for 75,000 cars, this tonnage to be delivered by boat from lower lake ports before the close of navigation.

While Chrysler will be adding substantially to its steel stocks, inventories will not be swelled to the extent that developed a year ago when rising prices induced the laying down of considerable tonnage.

NO SWEEPING CHANGES

Changes in the Chrysler lines will be relatively small, and this will be an aid to an early start on new models. There is the possibility that a procedure such as was followed two years ago in the case of Plymouth will be adopted. At that time the 1933 body and radiator design was changed several months after being introduced, the alterations being relatively minor but sufficient in effect to result in a new car.

With Chevrolet and Ford not scheduled to start work on 1935 offerings until November, Plymouth is likely to lead the annual unveiling act in the low-price field, with the General Motors' unit, according to present indications, the last to present its bid.

As an offset to what advantage may accrue to Chrysler through the Plymouth's early start, however, General Motors has the Pontiac which, with plans well advanced, will be the first of the corporation's new cars to be introduced.

The new Pontiac six, a companion car to the regular Pontiac eight, is expected to be priced fairly close to the field blanketed by Chevrolet, Ford, Plymouth and Terraplane. Pontiac assembly lines remained closed last week and the date of resumption on 1935 cars has not been indicated, although the company has closed on parts for its first half requirements.

Chrysler's activity, which has developed sooner than was anticipated, is the sole exception to the previous assumption that production of old models would be continued this year longer than usual with a consequent postponement of new car introduction.

The usual decline experienced in retail sales during this period has appeared, with the recession more rapid recently than during early September. Production has responded to the changes in retail demand, output the past week having been influenced downward more rapidly by this factor as well as by the suspensions of the three Chrysler units. Ford also curtailed, operating only two days, but resuming regular schedules this week.

October seems destined to witness a continuation of the recent decrease in output and sales. Some retail buying is expected to develop in farm districts from government crop and livestock bounties, and in certain areas where business conditions have been relatively favorable demand has been well sustained, but there is a little in the way of national developments to anticipate a reversal of the normal trend for the present. The Southwest lately has been making the best relative showing of various sections in new car buying.

BELOW A YEAR AGO

With September output of passenger cars and trucks in the United States and Canada totaling 150,000 to 170,000 units, that month is the first so far this year to show a decrease compared with the corresponding period a year ago. The drop from August was 30 per cent and from September, 1933, the loss was 14 per cent. October schedules are somewhat indefinite, but a liberal estimate places this month's total at no higher than 125,000 units, which would compare with 138,638 cars and trucks last year. November should mark a break in the six-months' drop as well as exceed the 1933 month.

The period of the year makes long-range planning of production schedules on present models hazardous since it is desirable to keep output attuned to the movement from dealers' stocks.

With a few exceptions stocks are

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1932	1933	1934
January	119,344	130,087	156,907
February	117,418	106,888	231,707
March	118,959	118,002	331,263
April	148,326	180,713	354,745
May	184,295	218,347	331,641
June	183,106	253,387	308,051
July	109,143	229,357	266,575
August	90,325	232,855	234,809
September	84,150	191,800	155,000*

*Estimated.

Estimated by *Cram's Reports*

Week Ended	
Sept. 15	43,560
Sept. 22	38,329
Sept. 29	37,234
Oct. 6	18,998

seasonally low, a condition which the industry wants to prevail at the time of new car offerings. Material releases on old jobs in some cases represent only a portion of requirements expected to be needed for a 30-day period. Chevrolet so far has released material for somewhat less than 20,000 units this month, although assemblies recently were on the basis of 2600 units daily, four days a week, with September output about 48,000.

Chevrolet closed Ford's lead in sales during September and at the end of last month was trailing in registrations by less than 2000 passenger cars and trucks for the first nine months of the year. Both companies are expected to continue through October on present models, with Chevrolet looking for the attainment of first place in registrations by Nov. 1.

Chevrolet, incidentally, is joining with Ford in using sporting events as an advertising means. Ford is gathering valuable publicity through its sponsorship of the world series broadcast, while Chevrolet will cover the country this fall with weekly broadcasts of the leading college football games in various sections. These will be in addition to evening musical broadcasts.

Chevrolet has placed some steel orders for new models and these indicate that there will be few, if any, changes in sizes of mechanical parts next year. This is more or less true of all makes, however, principal attention being devoted to body alterations, except for some revisions in carburetion.

ALL-STEEL TOP SEEN

Of chief interest in Chevrolet body changes is the understanding that an all-steel top will be used, with the possibility that this construction will be adopted for other General Motors units as well. Wood will be used for other body portions, as before, despite much development work on an all-steel body. Heretofore body makers have found it necessary to use some form of fabric for tops in order to eliminate the objectionable rumble resulting from a more solid type of construction.

On the average, bodies of next year's cars will be larger than those of present models even though most of them will not equal the Chrysler Airflows in roominess. The fact that new skids ordered by most body plants are larger than formerly would seem to bear out this idea.

Buick, which will carry its present model into next year before making changes, has scheduled less than 2000 units for October, compared with about 3400 in September. Inventory taking will keep the assembly lines down until Oct. 15.

Willys-Overland receiver has been given federal court permission to build 15,000 cars at Toledo. Departments are returning to work and production is expected to be well under way by Nov. 15 with 3500 employed. Orders for 5000 cars are reported.

Packard has brought out two new types of body which, appearing standard, actually can seat nine persons including the driver. One is a sedan limousine, the other a straight limousine, with front and rear seats both wide enough for three persons, and folding seats for three.

Production of the automobile industry declined to approximately 19,000 units last week, half the rate of the past three weeks, as Buick, Cadillac, Chrysler, DeSoto, Plymouth and Pontiac were closed.

Ford, which is to exhibit at the New York show for the first time since 1910, now that it is not under the auspices of the national automobile chamber of commerce, assembled 4800 units last week. Chevrolet turned out 8000, Dodge 1500, Olds 1200, Hudson-Terraplane 600, Studebaker 500, and Nash 300.

Died:

DR. CALVIN W. RICE, 65, for 28 years secretary of American Society of Mechanical Engineers, in New York, Oct. 2. A graduate of

Dr. Calvin W. Rice

Massachusetts Institute of Technology in 1890, he joined the Thomson-Houston Electric Co. and was employed there until 1893, when he went with the General Electric Co. Subsequently he was associated with a number of mining and utility interests. In recent years he conducted considerable research for the General Electric Co., especially in connection with radio.

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Thomas Bies, 58, part owner of the Mid-City Foundry, Michigan City, Ind., recently.

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Fred Kropf, 62, superintendent, Bradford Machine Tool Co., Cincinnati, Sept. 16.

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Edgar B. Thomas, 60, formerly city bridge engineer at Cleveland, associated with Wilbur Watson & Associates, and the H. K. Ferguson Co., in Cleveland, Oct. 2.

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Stuart Croasdale, 68, formerly chief chemist for the Globe Smelting & Refining Co., consulting engineer for Anaconda Copper Co., and Calument & Arizona Copper Co., and other mining interests, in Denver, Oct. 1.

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A. Walter Lorenz, 44, head of the research laboratories of the Bucyrus-Erie Co., South Milwaukee, Wis., Oct. 1. He was born in New Castle, Del., where burial took place Oct. 4. Mr. Lorenz was connected with the Bucyrus-Erie Co. for 18 years.

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Charles M. Runyon, superintendent of the Eaton Mfg. Co., Detroit, as a result of an automobile accident in Detroit, Sept. 28. Mr. Runyon was born in Catlettsburg, Ky., in 1895, and after service in the World war became purchasing agent for the Peterson Spring Co., Detroit, until that company was absorbed by the Eaton Mfg. Co.

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Calvin P. Richter, 45, metallurgist for Republic Steel Corp., in Clearfield, Pa., Sept. 29. He was well known in steel and automotive industries, and had been attached to the Detroit office of Republic Steel Corp. since early 1928. After graduating from Purdue university in 1913, he spent four years as a chemist with the Grasseli Chemical Co., and after other affiliations became connected with the Central Steel Co., Massillon, O., as a metallurgist.

Windows of Washington

(*Concluded from Page* 22)

other reason for representation of the steel industry in Washington in order that lumber, cement and other industries do not encroach on projects that normally should go steel. PWA Director Ickes has long favored a "permanent" PWA.

The ruling of Comptroller McCarl limiting the expenditure for the western tree belt, for which 165,000 miles of wire and 55,000,000 fence posts would be required, does not end the project, even though there is increasing skepticism concerning its feasibility. If the new deal decides to go through with the project the necessary funds probably can be obtained.

Here and There in Industry

YATES-AMERICAN MACHINE CO., Beloit, Wis., manufacturer of woodworking machinery, is embarking upon the market of heat transfer units of all types, including a full line of unit heaters and automotive radiators, according to Alvin Haas, vice president and general manager. During the past four months, an entire building at Beloit has been equipped and production started on the new line.

Roger Birdsell, who has been active in the manufacture and sale of radiators for the past ten years, heads this new division of the Yates-American company. Former associates of Mr. Birdsell in the radiator industry who have joined him include: G. W. Foote, superintendent; W. C. Klespe, chief engineer; and L. C. Evans, research engineer.

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One of the largest single orders for five separate and complete pressure lubrication systems for steel mill service has been awarded to the De Laval Separator Co., New York, by the United Engineering & Foundry Co., Pittsburgh.

The lubrication equipment for each individual system, consisting of a De Laval centrifuge for maintaining the condition of the oil, main oil circulating pump in duplicate, maintenance cycle circulating pump in duplicate, main oil reservoir tank equipped with cooling coils, pressure tank, sight flow and sight feed fittings, as well as electric siren, will be installed for use in conjunction with the new 44-inch blooming mill and 56-inch hot strip mill now being built for the Ford Motor Co. by the United company.

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Surface Combustion Corp., Toledo, O., has booked one walking beam pair furnace and two walking beam pack furnaces for the Steel Co. of Canada Ltd., Hamilton, Ont., and two slab heating furnaces for the new continuous strip mill which the Youngstown Sheet & Tube Co. is building at Youngstown, O.

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Atterbury Motor Car Co., Buffalo, is continuing production, pending court decision on its petition to reorganize under the new federal bankruptcy act.

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Revere Copper & Brass Inc., Michigan division, Detroit, has opened a branch office at 922 Grand Rapids National Bank building, Grand Rapids, Mich., in charge of David T. Applebee.

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George D. Miller Co., machine tool dealer, Cleveland, has been appointed exclusive representative, in Cleveland territory, which includes all northern Ohio, for the Lees-Bradner Co., manufacturer of gear hobbing machines, gear generators, thread milling machines and gear testing machines.

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Cummins Engine Co., Columbus, O., has appointed the Cummins Diesel Engine Corp., 51 East Forty-second St., New York, distributor for the Middle Atlantic and New England states. Elmer G. Griese is manager.

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Organization of the Coyle Barge Lines, operating boats from New Orleans to Houston, Tex., on the intracoastal canal recently completed gives Birmingham, Ala., iron and steel interests another route to the Southwest. Coyle Barge Lines is a subsidiary of the DeBardeleben Coal Corp., of Birmingham.

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Giant Grip Mfg. Co., Oshkosh, Wis., manufacturer of drive calk horseshoes and pitching shoes, reports that its production is larger than at any time in the past three years and at present is about 80 per cent of the 1929 level, according to G. A. Altendorf, manager. Recently the firm introduced interchangeable rubber calk for horseshoes, which absorb the road shock.

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Timken Roller Bearing Co., Canton, O., has booked an order from the Edward G. Budd Mfg. Co., Philadelphia, for bearings and boxes to be used on the two new high speed stream-lined "Zephyr" trains which they are building for the Chicago, Burlington & Quincy railroad. The two trains will operate on high speed schedule between Chicago and the Twin Cities.

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McKeesport Tin Plate Co., McKeesport, Pa., and not the Pittsburgh Tin Plate Co. as mentioned in this department last week, has acquired the National Can Co., Boston, through a subsidiary, the Metal Package Corp.

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It is interesting to readers of STEEL, who have seen the Timken Roller Bearing Co. advertisements in this publication, to note that the company was awarded first place by the judges for the most effectively conceived and executed industrial advertising campaign of the year in the tool and equipment division of the National Industrial Advertisers' association at the annual convention recently held in Cincinnati.

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Milwaukee Foundry Equipment Co., Milwaukee, has been awarded contract for installation of two coal pulverizers in the municipal power plant of Hartford, Wis. Each of the units will develop 750-boiler horsepower and will pulverize 1500 pounds of coal an hour. The Milwaukee Foundry Equipment Co. started making pulverizers last fall, and has made several installations, ranging in sizes handling from 250 to 5000 pounds of coal an hour.

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Kroeschell Boiler Co., Chicago, which took over the former Freeman Mfg. Co. boiler works in Racine, Wis., a year ago, and transferred its plant from Chicago, has moved its executive offices to Racine, although it plans to maintain a branch in Chicago.

Construction Products Co. has opened an office in Topeka, Kans., in the National Reserve building, in charge of K. M. Baker, formerly of the Wichita, Kans., office. The company handles a complete line of road and bridge materials, including reinforcing steel, wire mesh, road center strip, expansion joint materials, etc. The company has sales offices and warehouses in Kansas City, Mo., and Omaha, Nebr.

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United States Motors Corp., Oshkosh, Wis., has increased its business by 300 per cent this year, compared with 1933. A total of 450 electric generating plants has been sent to CCC camps, the signal corps, navy, lighthouses and the agricultural department. The government business is the best the firm has had in the 44 years it has operated in various forms, with the exception of the World war period. The firm's line of marine engines also has been more in demand this year, with the increase over 1933 put at 50 per cent. Plans are now under way by the company to introduce a line of diesel-powered electric generating plants by Jan. 1.

Mishaps of Zephyr Show Stainless Can "Take It"

IN THE parlance of the prize ring, it is now proved that the new all-welded light-weight trains of stainless chromium-nickel steel can "take it." Consider the Zephyr, crack Burlington articulated train, one of the first of the new units built by the Edward G. Budd Mfg. Co., Philadelphia.

Some time ago the Zephyr, coasting around a curve at 45 miles an hour, collided with a motor truck which had stalled on the tracks. The truck was loaded with steel scrap. The forward end of the Zephyr was bent, twisted and rather roughly used, but not a weld failed.

Also on its run west after being inspected extensively in the east soon after completion, a man, thought to be unbalanced, dropped a 25-pound rock from a viaduct above the train at Amsterdam, N. Y. It struck directly in front of the drivers window with terrific impact, denting the frame and bending reinforcement. But not a weld failed.

EDITORIAL

President's Fireside Talk Is Challenge to Industry

PRESIDENT ROOSEVELT'S "fireside" talk of Sept. 30, to a greater extent than any of his previous utterances, presents a clear-cut invitation—if not a deliberate challenge—to industry to assume a more articulate role and to adopt a more militant attitude in its participation in the national struggle for recovery.

This conclusion is based upon three characteristics which are reflected time and time again in the text of the President's address. First is the sneering tone, the contempt and the lack of sympathy or understanding which he persists in displaying toward industry and bankers. Second is the continued misrepresentation of facts which mislead the public. Third is the veiled admission that mistakes have been made.

On the first count, the President ran true to form in making sarcastic references to industry and to bankers. In saying that "private enterprise in times such as these cannot be left without assistance and without reasonable safeguards lest it destroy not only itself but also our processes of civilization," he again reveals his penchant for believing that the natural impulse of industry is destructive. Again in implying, as he did near the end of his talk, that American bankers are *not* helping their government, the President—perhaps unwittingly—reveals a state of mind which probably also embraces industry. It looks very much as if the Chief Executive holds the absurd idea that industry and bankers are trying to "block" his program.

President's Attitude Forces Industry To Go To Public To Prove Sincerity of Its Objectives

This situation presents to industry a challenge to continue to do everything within its power to prove to the President and to the American public that its motives are constructive, to demonstrate that its sincerity in working for reemployment and recovery and its desire to advance the welfare of the "average man" are no less than those of the President himself, and to convince the President that his prejudice against industry not only is unwarranted but is detrimental to recovery.

On the second count, the President distorted facts more carelessly than usual. His statements about the rise in industrial profits and the gains in employment, while true of certain segments of industry, do not present a clear, accurate picture of the real state of affairs. The statement in regard to "sustained profits within one year from the inauguration of NRA" is rather far fetched. The reiterated boast of gains in employment makes no allowance for the workers absorbed in government service. In emphasizing "rising" and "sustained" profits and expanding employment at a time when the number of persons applying for relief is mounting, the President gave a distorted view of a very important situation.

Reference To English Methods for Recovery Emphasizes Shortcomings of Our Own

However, his worst display of misinformation was in connection with his remarks on recovery measures in England. He neglected to say that England was forced off the gold standard, while the United States stepped off deliberately. He intimated that relations between capital and labor are further advanced in England than here, yet he neglected to say that British laws hold union labor accountable for its acts and he failed to say that if the United States had been given a law like the British disputes act, instead of our Section 7a, we too could enjoy the "advances" to which he alludes. Also, in stating that the British banker "helps" his government and inferring that the American banker does not, President Roosevelt neglected to say that the British banker did not help—in fact could not help—until his government had been cleansed of British experimenters.

The President's juggling of facts is a challenge to industry to work still harder to acquaint the public with the truth.

On the third count, President Roosevelt deserves some credit for admitting, evasively and reluctantly, that some features of NRA were mistakes and that the government policies in regard to labor relations have not worked out well. He would have deserved much more credit if he had accepted some of the blame for the administration, instead of inferring that industry—as writers of codes—should take full responsibilities for their defects.

The admissions, while unsatisfactory and evasive, are encouraging. They indicate that conditions of his own making gradually are forcing the President to veer around to the views which industry has entertained with increasing positiveness since last spring.

On all three counts, the fireside talk is a challenge to industry to intensify its efforts to convince the President and the public of the fact that a prosperous industry is the quickest and best avenue to prosperity for the greatest number of "average" citizens.

THE BUSINESS TREND

Improvement Continues, But Pace Is Slow

INDUSTRIAL activity is on the mend, but the improvement is almost imperceptible. The downward trend, which began last June, flattened out in September. Before the end of that month, a slight upturn was apparent, and on the basis of this reversal in trend hope was expressed in business circles that a gradual improvement extending to the end of the year would develop.

The experience of the first week of October is likely to cause observers to revise their expectations slightly. The trend probably will continue upward, but the pace of improvement will be slower than was generally expected.

From the standpoint of business sentiment, the President's fireside talk of Sept. 30 was more destructive than constructive. The Chief Executive could not conceal his contempt for industry and his lack of understanding of its problems. This attitude, which must be charged partly to the prejudices of some of the President's advisers, has become an important factor in the trend of business. Probably it is the principal deterrent to the natural improvement which is overdue today.

Barometers of Business Show Slight Gains Although Figures Remain Below 1933 Levels

Current barometers of business are mildly encouraging. Preliminary reports indicate that revenue freight car loadings for the week ending Sept. 29 will show a gain over the preceding week. If the total exceeds 650,000, as is predicted by the reports of important carriers, a new high for 1934 will be established. Output of electric power for the final week of September was up 1.1 per cent from the preceding week. However, car loadings and power output both were slightly under comparable figures for 1933.

Steelworks operations are barely holding their recent slight gains. The monthly figures for iron and steel show production at low levels in September. Iron and steel exports in August were up slightly, a fact which is encouraging because scrap exports declined.

Encouragement is found in the apparent halt in the decline of prices of steel scrap. Uncertainty in prices of finished steel also is less pronounced.

1934	
Aug.	73
July	75
June	83
May	86
April	86
March	85
Feb.	81
Jan.	78

1933	
Aug.	91
July	99
June	91
May	77
April	67
March	60
Feb.	64
Jan.	65

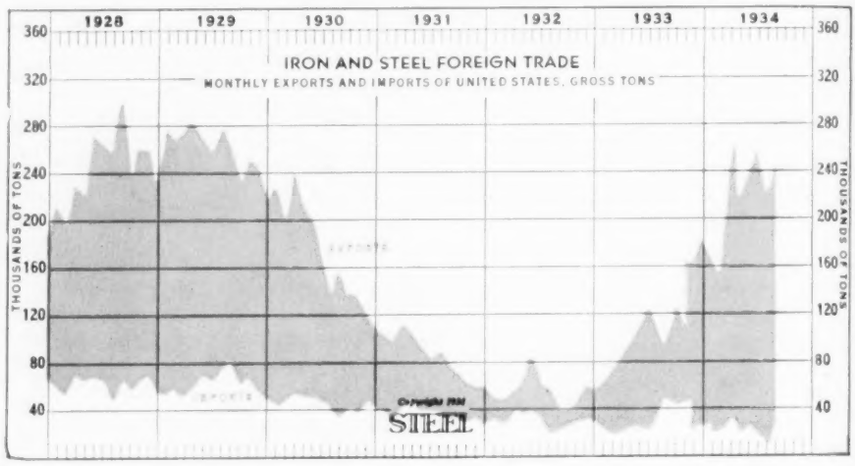
Exports		Imports	
August, 1934	$171,965,000	August, 1934	$119,515,000
July, 1934	161,655,000	July, 1934	127,229,000
August, 1933	131,473,000	August, 1933	154,918,000

Merchandise Exports Gain Moderately in August

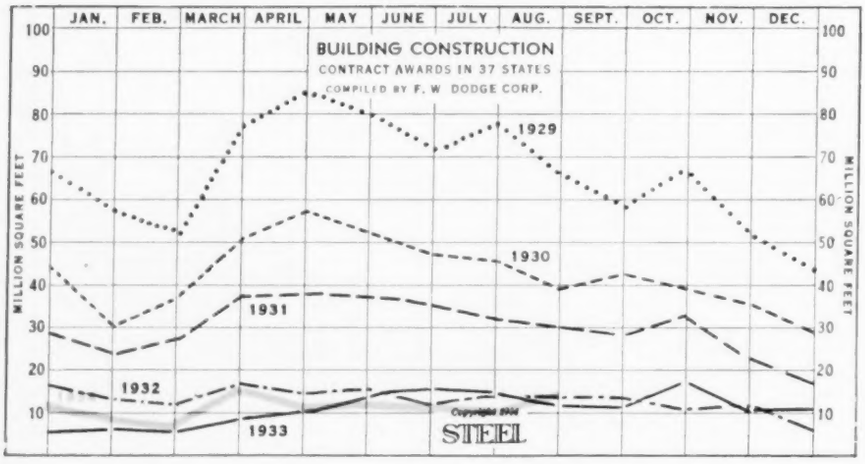
The foreign trade statement for August, issued by the department of commerce, shows a moderate upturn in merchandise exports. The value of merchandise shipped during August was $171,965,000 and compared with $161,655,000 in July and $131,473,000 during August, 1933. Imports during August declined slightly to $119,515,000 and compared with $154,918,000 in the same month last year. Ordinarily total exports advance about 4.5 per cent in value from July to August, while general imports increase 4.3 per cent.

Steel Import Trade Up Sharply; Exports Gain Less

Imports of iron and steel products into the United States in August increased slightly more than exports, thereby making the trade balance a little less favorable than in July, according to the iron and steel division of the department of commerce, Washington. Imports in August totaled 32,418 gross tons compared with 17,676 in July and 46,839 tons in August, 1933. More than half of this import tonnage during August was pig iron with a total of 18,418 tons. Exports at 242,947 tons compared with 233,186 in July and 119,374 tons in August, 1933



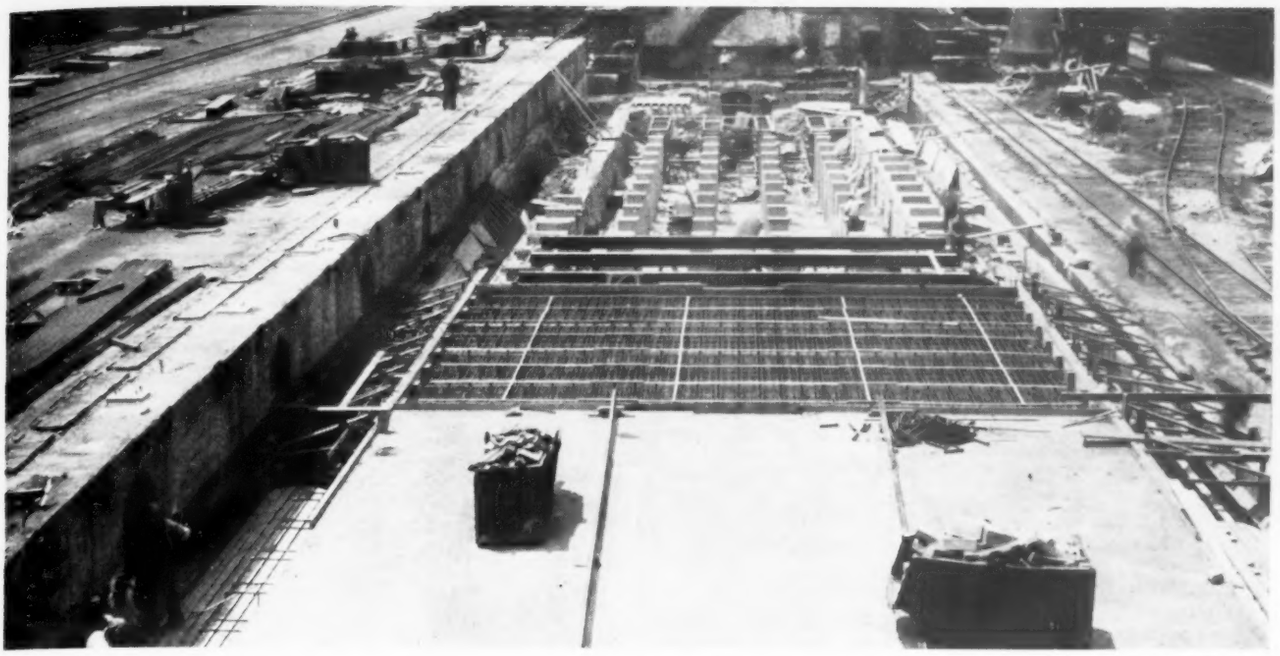
Exports	Tons	Imports	Tons
August, 1934	242,947	August, 1934	32,418
July, 1934	233,186	July, 1934	17,676
August, 1933	119,374	August, 1933	46,839



	Square Feet
August, 1934	14,259,000
July, 1934	13,250,000
August, 1933	12,942,100

Building Awards Improve Over Year Ago

Building awards as measured in new floor space in 37 eastern states gained over a million square feet during August. According to the report of F. W. Dodge Corp., total construction for August involved 14,259,000 square feet and compares with 12,942,100 square feet in August, 1933. During the first eight months of this year awards totaled 102,922,600 square feet of floor space and shows a slight improvement over the corresponding period last year when awards totaled 95,438,000 square feet.



Reconstruction view of two batteries of coke ovens, showing excavation, basement floor, concrete columns, H-beams, steel reinforcement and heat-resisting concrete floor slab

REFRACTORY, HEAT-RESISTING CONCRETES SHOW STAMINA IN FURNACE USES

IN 1925 a new type of concrete was used in a small way for patching furnace linings and ash pits and in the following year a few special refractory shapes were made of it. Since then it has become adopted widely for use in all sorts of refractory applications.

The binder in this refractory concrete, an alumina cement, had the same property as regular building cement of setting and hardening upon the addition of water to bind together crushed aggregates which, for refractory concrete, must themselves be refractory. Experience with the use of ordinary concrete and cement for some construction exposed to high temperatures in and around industrial furnaces was then and is now unsatisfactory. While building cement has proved its value for fireproofing and resistance to heat in large conflagrations, its nature is such that exposure to high temperatures encountered in industrial furnaces is not one of its attributes.

Alumina cement used for refractory concrete is made of bauxite and it is fused completely in its manufacture. It does not give off lime when it hardens after the addition of water and when later exposed to high heat. On the other hand, when in operation as a furnace lining, after having been properly proportioned with appropriate refractory aggregates for the particular temperature of exposure, it combines with the finer portions of the aggregate in the development of fired strength or ceramic bond.

Today, there are some 25 trade-marked mixtures for making refractory concrete. All of these possess this property of hardening upon the addition of water and they become hard and strong in about 24 hours. Most of them contain carefully selected and proportioned aggregate when shipped, saving the user the trouble of selecting and crushing suitable refractory aggregate and proportioning his mix. Such mixtures are suited admirably for the many uses for which they are recommended. They provide a scientifically prepared mixture for users not equipped to make their own economically.

Refractory concrete, 12 inches thick, for upper portion of annealing pit walls

Refractory concrete is used today in all of the heat treating industries and in some cases in large quantities. One steel producing and finishing

plant uses about 2500 cubic feet of refractory concrete a month. In this plant, every furnace door, with the exception of open-hearth doors, is lined with refractory concrete and door lining costs are now one-sixth the former cost. In another plant, open-hearth furnace doors are lined with refractory concrete, utilizing crushed old chrome brick as an aggregate. This application has proved satisfactory and economical.

In one malleable iron plant more than 1500 cubic feet of refractory concrete is used per month, largely for blocks or stools on annealing furnace cars to carry castings through the annealing furnaces. Annealing furnace doors and car tops also are being made of refractory concrete.

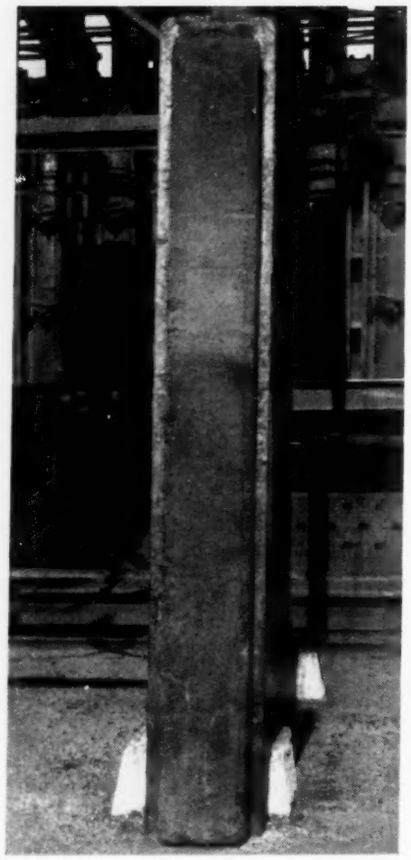
During recent years, the necessity of rigid economy has stimulated greatly the use of refractory concrete. Today more than 50 per cent of all by-product coke plants are using refractory concrete. Such uses include door linings, riser pipe linings, jamb repairs, grouting tops of ovens and for making special shapes and miscellaneous repairs.

One large plant is now preparing a casting yard to be equipped to utilize the best accepted practices for making high quality concrete for precasting sectional linings of oven doors. In several oil still furnaces a number of adaptations of refractory concrete have been made. Furnace walls 40 feet long and 16 feet high have been made of precast refractory concrete blocks.

Heat-Resisting Concrete

Besides such strictly refractory uses as the foregoing there are other uses of concrete which the operating man has generally viewed as being in the construction field rather than the refractory field but for which heat resisting concrete is better suited. Two of the principal types of these structures are floors exposed to the heat of furnaces or hot castings and furnace foundations.

Heavy concrete foundations under furnaces are being constructed with alumina cement to minimize the disintegration which results from the soaking heat. Formerly, these foundations were constructed with regular building cement.



Coke oven door lining made of one part alumina cement and three parts crushed clay firebrick, placed at one-half the cost of former linings. It had been in continuous service about 18 months when this photo was taken

More and more information is coming to light regarding the present condition of concrete foundations under furnaces built some years ago. In the past it was considered sufficient protection to a concrete foundation to use insulation and firebrick. A number of installations have been found where the concrete protected by this method has disintegrated due to the heat which has soaked through both the firebrick and the insulation. In fact, many question the value of insulation to protect the foundation, since the foundation in turn acts as a heat retarder, allowing the temperature in the insulation to rise so high that it affords little or no protection to the concrete.

Recently some massive concrete walls of oil still furnaces were exposed and when the brick facing was removed, part of the vertical concrete walls tumbled down. That condition of total disintegration, as shown in an accompanying illustration, varied in depth from 1 to 3 feet. Those parts of the concrete in which limestone aggregate was used were in the worst condition and much of this old concrete was removed by shovels. In some of the concrete, blast furnace slag had been used as an aggregate and while the aggregate itself was in better condition than the limestone, the cement binder was calcined and entirely "dead," and the concrete easily dislodged. This condition in the concrete existed in spite of the fact that the operating temperature in the furnace was only 1500-1700 degrees Fahr. and the concrete had been protected with 13½ inches of firebrick and 4½ inches of insulating brick.

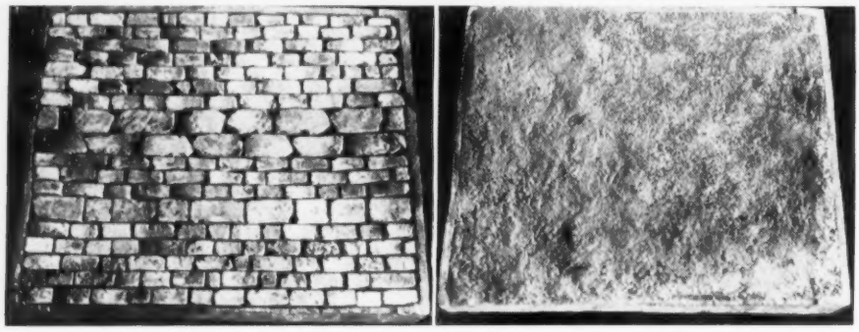
Replacing Building Cement

Some of this concrete had been repaired about a year previously with a high early-strength building cement. Nevertheless, it was found to be in about the same condition as the other concrete built of regular building cement about five years previously.

One large engineering organization now limits the use of building cement concrete to temperatures of only 500 degrees Fahr. whereas they formerly permitted the use of building cement concrete in temperatures of 1000 degrees Fahr.

Two examples of the results from the use of heat-resisting concrete made of alumina cement illustrate its efficiency. A foundation for an open-hearth furnace was required in the shortest possible time. For this reason, alumina cement was used. At the expiration of one year, as had been the custom when regular building cement was used, part of the furnace bottom was removed to repair the concrete foundation. It was found that the foundation was in excellent condition. The same satisfactory condition was found the next year and the next, and this foundation is still giving satisfactory service.

Another example of the effect of heat on concrete occurred in connection with an incinerator stack. This was built of regular building cement and after some years' use it was found that the lower 40 feet of the 150-foot stack was in poor condition, if not hazardous. It was necessary to replace the lower 40 feet of



A method of lining plate mill, merchant mill and other reheating furnace doors. At the left are shown brickbats set and ready for refractory mortar grout and facing. At the right is shown the door lining after grout and facing have been poured with refractory mortar and sufficient water so mortar can be poured between brick

the complete stack. By an ingenious scheme the lower 40 feet of the stack was replaced with heat-resisting concrete made of alumina cement. The disintegration of the stack continued above the replaced section and when the stack was finally demolished, the part made with alumina cement was difficult to remove and had been affected little, if any, by the 5-year exposure to the heat in the stack.

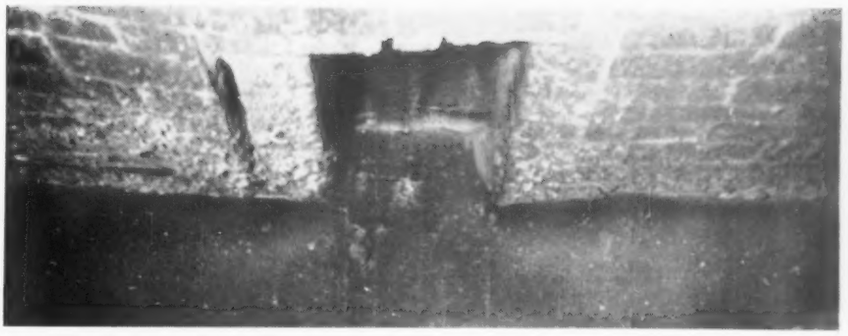
In the selection of materials for building a concrete foundation for furnaces, both the cement and aggregate should be selected with care. The use of either cement or aggregates which will release lime under the heat exposure should be avoided.

Silica aggregates are questionable because of the expansion between 300 and 600 degrees Fahr. Some silica aggregates have an expansion in this range of 1.2 per cent. Obviously, such volume change will not be beneficial to the foundation.

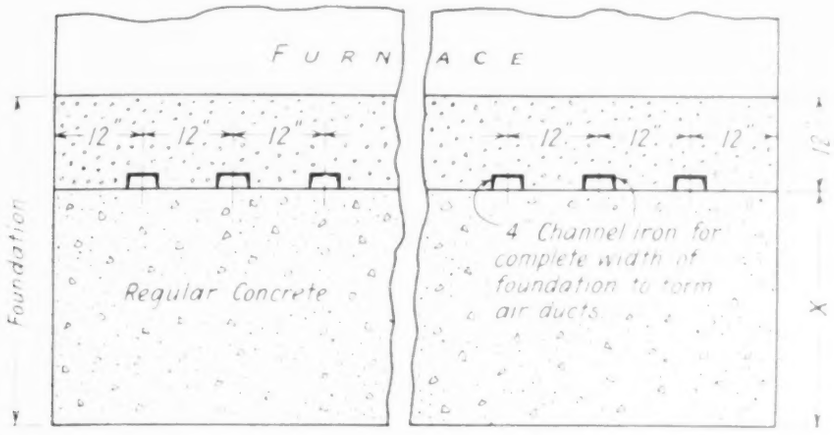
With the elimination of lime-releasing materials and silica aggregates, such as sand and gravel used in regular construction concrete, the available materials are limited. The best aggregates readily obtainable are some type of pre-fired clay. The expansion of aggregates of this type will vary in the range from 300 to 600 degrees Fahr., from 0.2 to 0.5 per cent. Old firebrick or paving brick often are available in large quantities. Old common brick, preferably those which are hard-burned, usually are obtainable anywhere.

If brick from an old wall are used, care should be exercised to remove all of the joint material, which usually is high in lime. These materials require crushing to aggregate size before being used. Also, there is available a prepared, light-weight clay aggregate called Haydite. The use of old firebrick in cases where the foundation takes up ground water for a considerable part of the time should be avoided.

Building large mass foundations involves another problem. This is the effect of the heat generated by the cement during hardening and the stresses set up in the concrete. With a cement which develops its strength over long periods of time, the heat in the mass foundation may not reach its maximum temperature until a month after it has been placed. It will not lose this heat for months and this condition may be aggravated by the additional heat from the furnace. This results in stresses in the concrete which may cause serious cracking of the foundation.



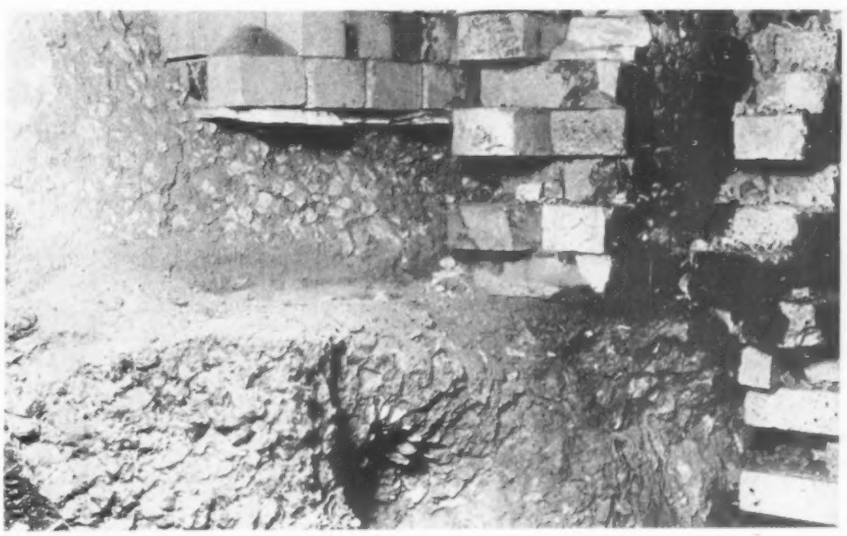
Refractory concrete roof slab on interior of incinerator. The blocks are 8 x 8 inches square, 4 inches thick. This roof had been in service about eight months when the photo was taken



Sketch showing method of air cooling concrete foundation for furnaces. Top 12-inch layer is made up of alumina cement and clay aggregate such as crushed fire, paving or hard burned common brick

The best way to minimize this condition is to use heat-resisting concrete and place the concrete in the foundation in layers 12 to 15 inches thick, allowing 36 to 48 hours for the placing and cooling of each layer. Within 24 hours after placing, 75 to 90 per cent of the hydration of the alumina cement has taken place. The additional time before placing the next layer will permit dissipation of most if not all of the heat generated during the first 24 hours. To accomplish this, it may be necessary to keep the concrete wet to insure complete dissipation of the heat in this short period of time. This method results in the foundation being practically free from stresses within 48 hours after completion, with no possibility of cracking from that cause.

In many cases, especially when the



Massive concrete furnace walls protected by 13½ inches of firebrick and 4½ inches of insulating brick. When brick facing was removed after five years' operation, part of the vertical concrete walls tumbled down. The concrete had little or no strength for a depth of 12 to 30 inches behind the insulation

Heat-resistant concrete floor laid in front of a battery of heating furnaces

foundation is exposed to ground water, it is advisable and economical to use sand and gravel or broken stone in the concrete until the next to the last layer has been placed. Before the last layer is placed, 3 or 4-inch steel channels, flanges down, may be placed on the concrete about 12 to 15 inches apart. The last layer of heat-resisting concrete made with clay aggregate may then be placed over the channels for the desired depth (see sketch on page 31). These channels form air passages through the concrete foundation, dissipating the heat and protecting the concrete in which the sand and gravel is used. Where only moderate-size foundations are used, it is entirely feasible to employ portland cement for the lower part, incorporating the air-cooling passages and an alumina cement-clay aggregate pad on the top as already described.

Concrete floors exposed to heat encounter much the same conditions as those found in furnace foundations. Much better results will be had by using heat-resisting concrete made of alumina cement and clay aggregates combined with careful workmanship, including ample curing.

To Develop Inspection Methods for Surface Flaws in Structural Steel

WORK will be started by committee A-1 on steel of the American Society for Testing Materials on the development of inspection methods and recommended practices for surface imperfections in structural steel, especially in the heavier sections, there being a demand for standardized procedures because of different practices now used. Requirements for high-strength structural rivets are expected to be submitted and specifications covering reinforcing bars rolled from standard axles are being studied. Standard requirements for carbon-steel and alloy-steel still tubing for refinery service have been drafted.

According to a recent progress report of the committee, standard methods of chemical analysis of carbon steel and of alloy steels are to be revised and brought up to date. An important change will be the inclusion in these revised methods of procedures for the analysis of cast and wrought irons, this work being in cooperation with the committees on cast iron and wrought iron.

Committee A-1 has as one of its most active projects the development of standards covering materials for high-temperature service. Alloy steel castings and seamless alloy steel pipe for service from 750 to 1100 degrees Fahr. are covered in tentative specifications just issued by the Society, and requirements for alloy steel bolting, nuts and forgings are nearing completion. A proposed standard for carbon steel nuts for steam service up to 850 degrees Fahr. will be submitted shortly.

Compile Creep Test Data

A committee section on high-temperature data proposes to compile creep data for available materials covering a range of temperatures from 750 to 1100 degrees Fahr. which fix their load-carrying ability with reference to various rates of creep ranging from one per cent in 10,000 hours to one per cent in 100,000 hours, the rate of creep being taken as that obtained over the period extending from the 700th hour to the 1000th hour of duration of the test.

The committee will continue studies of heat-checking of steel dies and plans to conduct tests to determine the effect of repeated heating of the surface of steels followed by drastic cooling after each heating period at temperatures attained by dies during operation in casting practice.

Standards for Wrought Iron

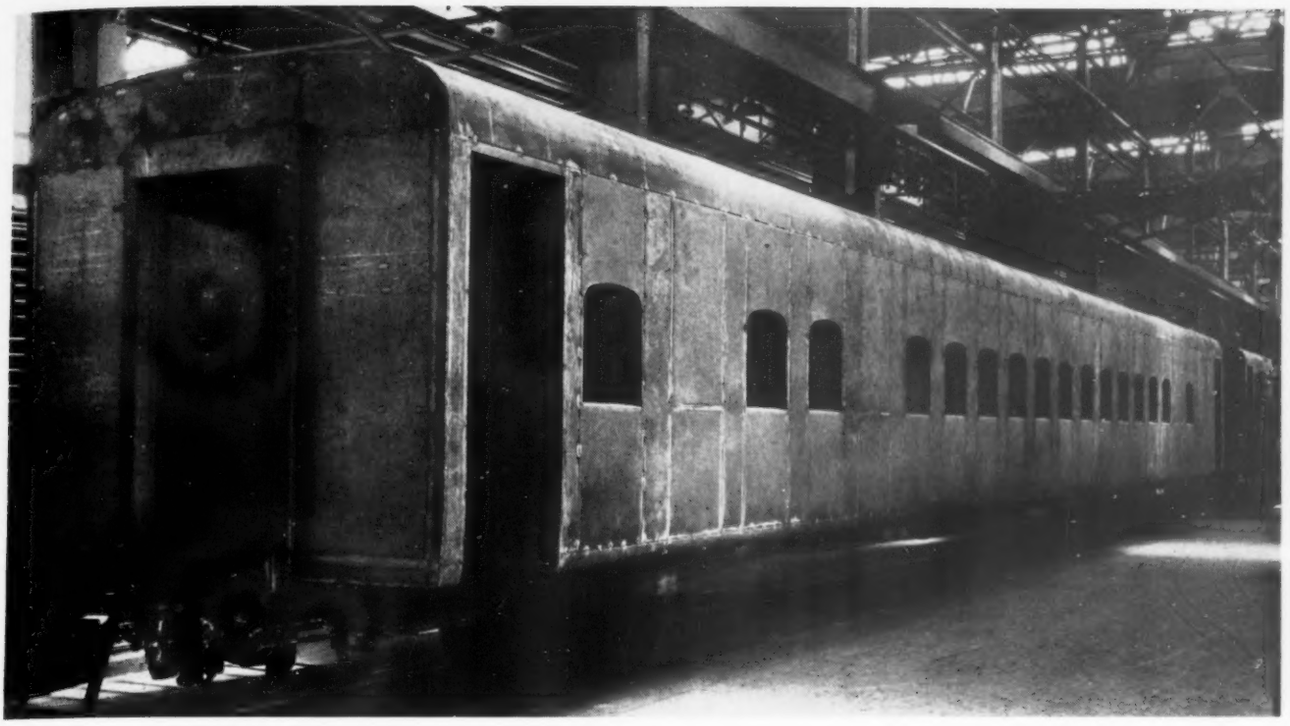
Committee A-2 on wrought iron will conduct a critical study of the desirability of changes in the required manganese content of refined and common wrought iron bars, and will investigate the inclusion of the so-called free bend test in the standards covering wrought iron products. Two proposed standards for wrought iron sheets will be submitted and a study is to be made of requirements for single refined iron which will not permit the use of purchased scrap in manufacture. Another important problem is the possibility of inclusion of a "work ratio" (ratio of size of original bloom or pile to finished product) instead of the present designation "single" and "double" refined iron.

Committee A-3 on cast iron is conducting an extensive series of investigations on test bars, involving methods of making, correlation of test bar size and controlling section as shown in A.S.T.M. specifications for gray iron castings, and when the final report is made desirable changes will be proposed in the specifications.

A standardized impact testing machine also is being developed. Results with this machine should indicate the possibility of formulating a standardized method of impact testing for cast iron.

Seaplane Ramp Pontoons 12 Feet in Diameter

In a description of the steel pontoons supporting the new seaplane ramp at the foot of Wall street, New York, which appeared on page 40 of the Sept. 17 issue of STEEL, it was erroneously stated that the inboard pontoons have a 12-inch inside diameter. Actually, these inboard pontoons are 12 feet inside diameter and 46 feet long. It also was erroneously stated that the joints, aggregating about 600 feet and welded in the plant of the Buffalo Tank Corp., Arlington, Staten Island, N. Y., were made with ¼-inch bare wire. The wire was ¼-inch heavy coated rod manufactured by the Reid-Avery Co., Philadelphia.



One of 50 new all-welded steel passenger coaches built by the Chicago, Milwaukee, St. Paul & Pacific railroad

Railroad Coach Construction Lowers Operating Costs

SAVINGS of 35 per cent in weight are reported possible by the use of welded steel construction in 50 new streamlined air-conditioned passenger coaches which the Chicago, Milwaukee, St. Paul and Pacific railroad is building in its Milwaukee shops for both day and night service between Chicago and the Pacific coast. The construction of these coaches will bring about new economies in train operating costs and will facilitate higher speeds. In addition to the savings in operating costs, the company saves the price of thousands of pounds of steel in construction of each coach.

Of conventional sizes, the coaches are 80 feet 8 inches long over the pulling faces of the couplers, 10 feet wide and 13 feet high above the rails. Total weight of one coach is approximately 96,000 pounds compared with about 146,000 pounds for previously built coaches of the same size.

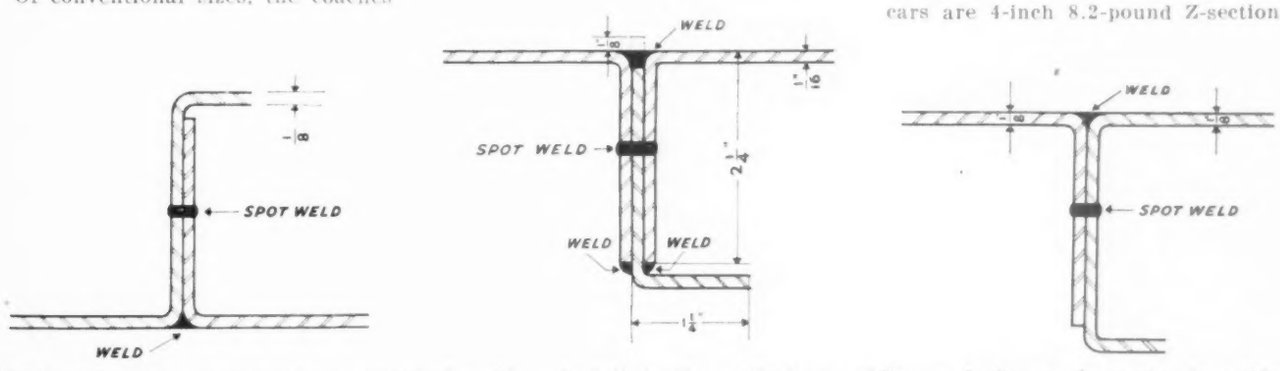
The coaches are moderately streamlined and tubular in shape, with a roof of turtle-back form. There are none of the usual projections, such as window sills, on the sides, sheets forming the sides being rounded inwardly below the windows to provide smooth passage of air along the sides.

The entire body of the coach is assembled by arc welding. A built-up design comprising structural shapes, plates and sheets joined by welding is the basis for construction of the underframe which includes the center sill, bolsters, buffer beams and body end sills.

In welding the pan-like sections of the floor structure of the cars, they are assembled together with flanges upward. The flanges then are spot welded, after which the entire assembly is turned over and welded continuously by the shielded carbon arc process. A detail of this construction is shown in one of the accompanying sketches.

The floor pans are of ⅛-inch sheets formed with the flange extending from one side sill to the other. The welds joining this underframe floor structure to the center sills are intermittent.

Steel shapes, sheets and stampings, all joined by welding, are used in construction of the body and vestibule end frame. The side sills of the cars are 4-inch 8.2-pound Z-sections



Sketches showing cross sections of typical welds. At left is the method of welding underframe; in center is welded joint used in constructing turtle-back roof; at right is method of joining the pans forming the coach sides

extending from one corner post to the other.

The sides of the coaches embody three different sizes of pans, all fabricated from ⅛-inch sheets. Structural strength is gained by forming flanges on the sheets to give angle and channel effect.

The first sized pan used in side construction extends between the windows from the side sill to the side plate. The second size pan extends from each window down to the side sill. The top flange of these pans forms the window sill. The third sized pan extends from the top of the window to the side plate. These pans have angle-shaped flanges on all four sides.

Stampings used in the coach side construction are made with open corners (later filled in by welding) and the holes punched in the flanges for bolting them together and lining up the superstructure before welding.

The pans forming a side of a coach are assembled in a jig bolted down, welded automatically, one pan being welded to the other on the smooth outside face. These welds are continuous for the length of the pan, a typical automatic weld being shown in the sketch.

After the pan corners are filled in with a deposit of weld metal, and after the temporary bolts are removed, the side structure is turned over and the flanges are spot welded to one another, as shown in an accompanying illustration.

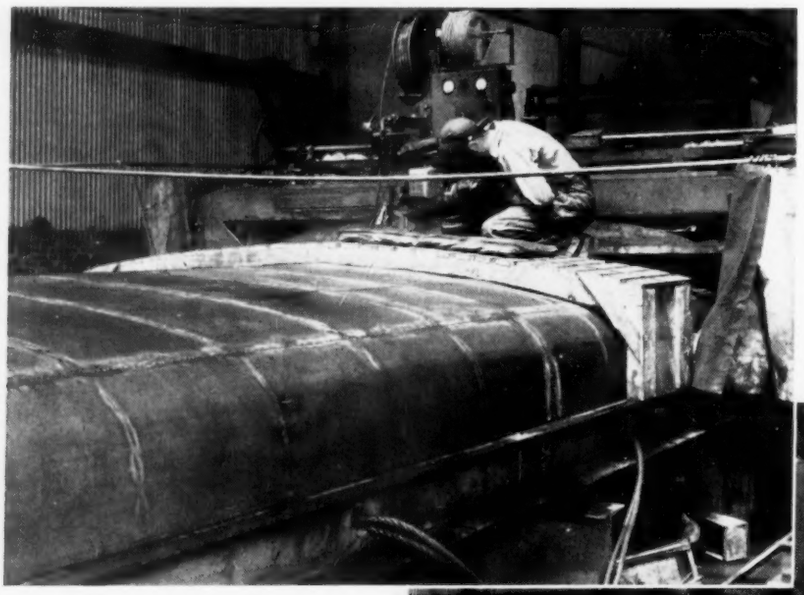
Window frames are fabricated from 12-gage steel, pressed into U-shaped contours. Flanges project inwardly to coincide with the window construction.

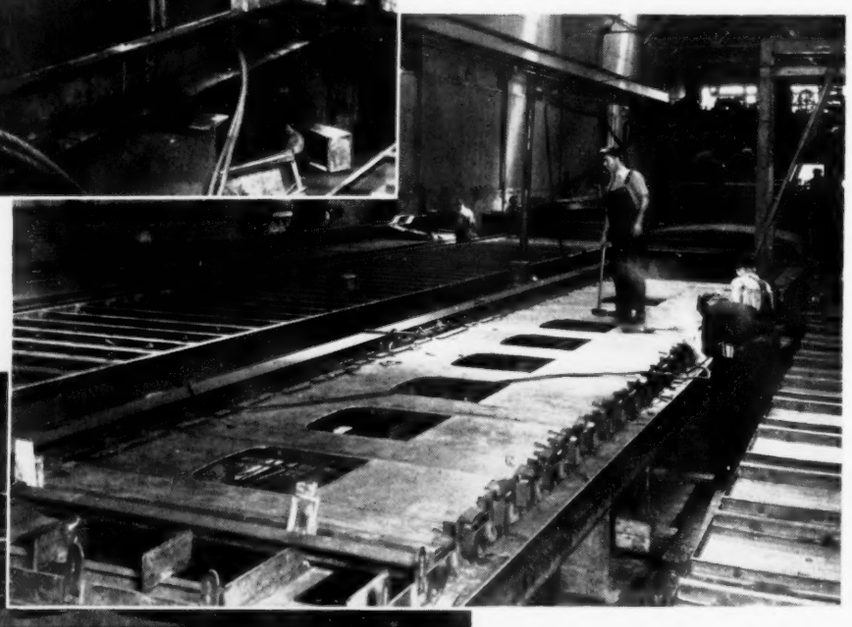
Construction of the turtle-back roof consists of 1/16-inch steel sheets pressed into pans flanged on all four sides and also 3/16-inch pressed side plates. Steel strips, ⅛-inch by 3 inch, are welded between the center pan flanges to form the ridge pole.

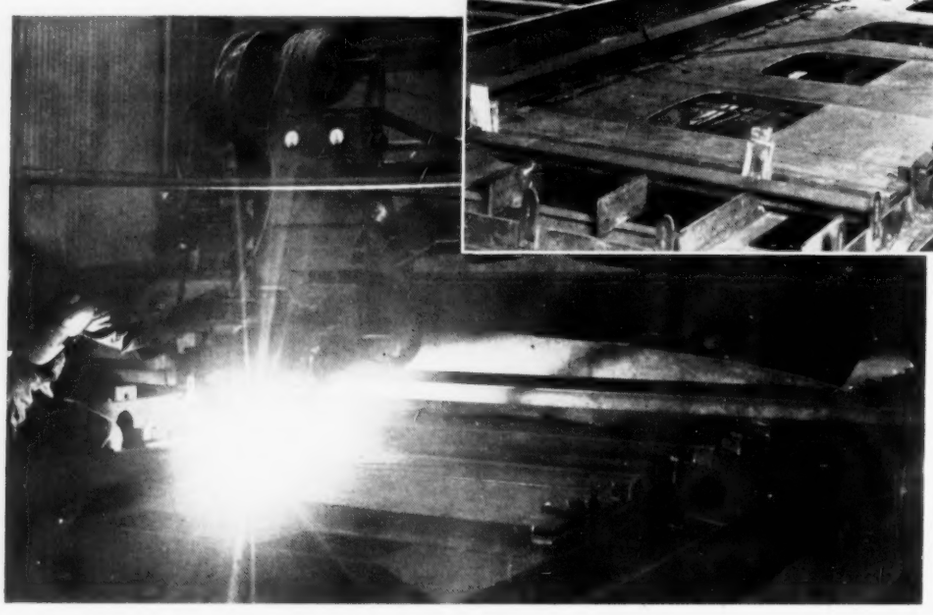
In welding the roof pans, a strip projects above the surface of the pans and the carbon arc used in the automatic welding melts the strip down, thus providing filler metal between the flanges. A typical weld employed in construction of the roof is also shown in the sketch.

The smooth appearance of the coach exterior, as shown in the illustration on page 33, results from the uniform bead deposited by the automatic welding and by a system of water cooling which minimized warpage. This water cooling system consisted of an arrangement of drilled pipes in connection with the welding jig. Located under the material being welded, these pipes provided a continuous spray of cold water upon the under side of a joint while it was being welded. This method of cooling was sufficiently effective to permit placing the bare hand on the weld within five inches of the arc. Due to the fact that heat was pre-

(Please turn to Page 39)







Automatic welder in operation (above) assembling roof sections of one of the new coaches

ONE of the coach sides is shown above clamped in a jig after being bolted together. A welder is at work on the lower edge. Illustration to the left is a camera study of an automatic carbon arc welding machine in operation, making welds on the inner side of the side panel

Fig. 1—Workers at a CCC camp in Wisconsin preparing ½-inch steel reinforcing bars for use in constructing concrete dams and concrete pipe for earth dams

Soil Erosion Check Dams Require Considerable Steel

AN IMPORTANT new outlet for steel has been created by the nation-wide soil-saving work conducted by the forest service of the United States department of agriculture. Individual requirements of each job usually are small, but in the aggregate they are large.

Included in these requirements are steel reinforcing bars, wire, woven wire fence, fence posts and steel cable. The reinforcing steel is employed in building concrete dams and concrete pipe. The wire, woven wire and steel cable are used in temporary dams. These temporary dams are intended to check further erosion in gullies. After the dam has been constructed, the sides of the gully are sloped and planted to trees; the temporary dam serves to check erosion until the trees have become sufficiently established to prevent further erosion permanently.

Needs Vary with District

Requirements vary somewhat in different states. In Wisconsin, a large amount of reinforcing steel is being used. Particularly large quantities of wire are used in Iowa and Illinois. The former uses a 2 x 4-inch wire mesh for the construction of erosion check-dams, the latter is using standard woven hog wire.

Steel piling is applicable to the construction of check dams in gullies but is used only in a limited way. Estimates show the material costs for dams built of steel sheet piling to be fully as high as the material costs for similar dams built of concrete, whereas the labor costs for sheet piling dams are considerably lower than for concrete dams. Inasmuch as practically all of this soil-saving work is done in CCC camps, the tendency is to use concrete construction which provides more suitable labor on the part of the CCC workmen, who are for the most part young men.

Other reasons prevent the encouragement of the use of steel piling in erosion control dams. One is the lack of experimental data on the use of steel piling in such dams; another is the lack of proper equipment at the CCC camps for welding, cutting and driving the steel piling; and still another reason is that the farmer is required to make a contribution to all work done on his farm and generally the farmer supplies wooden posts as a part of his contribution. Furthermore, the temporary check dams are built only for a life of four to five years, so that steel piling is considered unnecessary.

How the workers at the CCC camps bend and otherwise prepare concrete reinforcing bars in the state of Wisconsin is shown in Fig. 1. They are working with ½-inch steel bars, for use in constructing concrete dams and concrete pipe for earth dams.

Fig. 2 shows the construction of a wire dam near the head of a gully in southern Illinois. After the woven wire has been set in place, supported either by wooden or steel fence posts, poles or brush are laid back of the wire and earth fill is placed on the upstream side of the poles or brush. The final operation is sloping the banks and planting them to trees.

Reinforced by Cable

On the longer dams of this type, in gullies with larger drainage areas where more strength is required, ⅜-inch steel cable frequently is used to reinforce the dam. This is strung along the tops of the posts and anchored to the gully banks. Such cable also occasionally is used in smaller drainage areas where no supporting posts are used. This type of construction is used to a wide extent on gullies having small drainage shed areas.

Another type of temporary check-dam used extensively consists of brush, anchored in place by No. 10 gage galvanized wire attached to wood stakes or steel fence posts driven into the ground. Still another type consists of rock and field-stones, covered by woven wire to keep the loose rocks from washing away. Steel culverts and concrete pipe are employed to a large extent in carrying run-off water through or around earth dams. The same function also is accomplished in many dams by means of spillways.

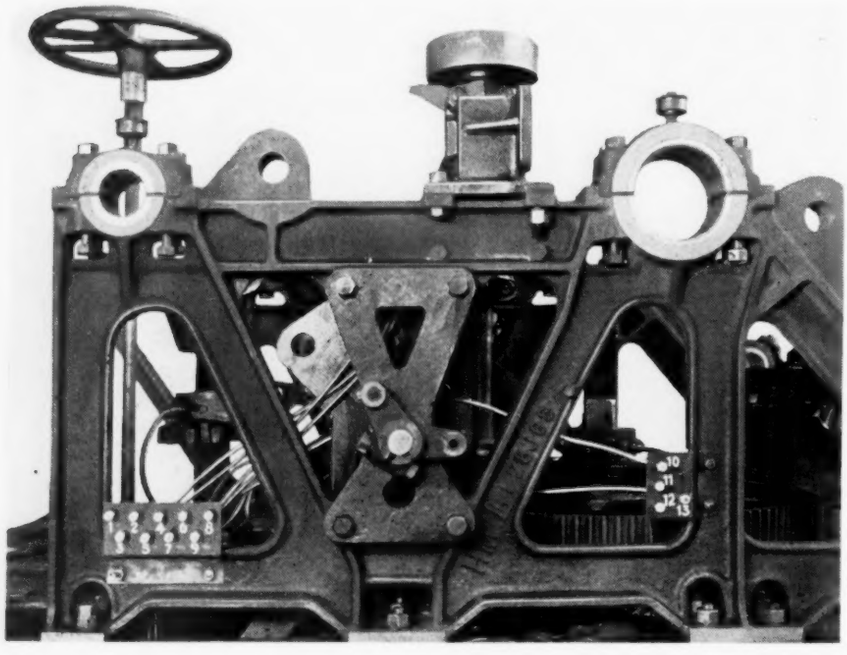
Permanent dams are placed in many gullies which have large drainage areas and where a large volume of water has to be lowered over an active gully head. In such cases, concrete construction is the usual practice.

Fig. 2—A wire dam near the head of a gully in Southern Illinois. Poles and brush are laid on the upstream side and earth fill added. Sides of the gully are about to be sloped and planted to trees

Central Greasing On Excavators

AN IMPROVEMENT in the form of centralized lubrication has been made by the Harnischfeger Corp., Milwaukee, in its line of excavating machinery. It formerly was difficult for operators of these machines to keep them properly oiled and greased and the operator was forced to crawl all over the machine, under the carbody, beneath the drums, around the jackshaft and elsewhere and in many cases the places more difficult to reach frequently were neglected with resulting deterioration.

In the accompanying illustration is shown a central greasing station on one of these improved excavating machines, from which the upper structure of the machine is kept greased. Four such stations serve the main machinery on most models. They are fitted with alemite nipples, with pipes leading from the nipples to the bearings.



Central greasing station on upper structure of improved excavating machine

s s s

Train's Air Tanks Serve Emergency Rivet Hammers

Compressed air stored in cylinders can be depended upon in an emergency to operate a riveting hammer or other pneumatic tool. This was proved not long ago in the case of a hurry-up repair job on a power-line standard that was damaged as the result of a derailment on an electrified railroad. Lacking portable compressor at the scene of the accident, two of the train's air cylinders served to supply power to drive 64 rivets and to ream the rivet holes. For this purpose the cylinders were provided with two 10-foot lengths of hose; and regulating valves maintained a working pressure of 90 pounds. A record was kept of the air consumption, and this showed that an average of 11 cubic feet of air was required to drive one ⅞-inch rivet and that eight holes were reamed with 100 cubic feet in less time than the crew could have reamed one hole by hand.

s s s

Molybdenum Steel Gains Favor in England

A very popular alloy steel in England is one of the following composition: Carbon 0.10 to 0.20 per cent; silicon less than 0.15 per cent; manganese 0.40 to 0.60 per cent; copper 0.40 to 0.60 per cent; and molybdenum 0.25 to 0.50 per cent. This steel combines corrosion resistance with high temperature strength and is used in the new type boilers operating under high steam temperature and pressure. The molybdenum content is raised as the working temperatures go up. The tendency today is to go to higher copper contents, up to occasionally as high as 1.5 per cent. The Lancashire Steel Corp. Ltd. makes a specialty of this steel and service results have consistently brought in repeat orders.

s s s

Novel Use of Angles

A tonnage outlet for steel angles promises as a result of a new type steel railroad bridge deck installation. Instead of placing the wooden ties directly on the bridge deck, two lines of 8 x 4 x 7/16-inch steel angles the length of the bridge are set up approximately 15 to 16 feet apart.

Rail ballast is poured into the space between these guard rails and on top of the wooden ties thus imbedded in the ballast. This means of setting track on a long bridge greatly reduces the fire hazard inherent with exposed wooden ties. On a bridge near Pittsburgh, fire watchmen have been eliminated since the installation of this form of rail bed and a maintenance saving of over $8000 yearly is expected.

S S S

Frog Crossings Are Flame Hardened

AN INTERESTING problem of flame hardening recently was worked out by the frog and switch department of a steel company in connection with frog crossings for a street railway. These frog crossings were of the flange-bearing type. That is, when a wheel passes over them, the weight is transferred from the wheel tread to the flange. This design eliminates the impacts when the wheel treads pass over the frog points. The purpose of the hardening was to increase wearing ability of the flangeway surfaces.

Following some preliminary experiments with scrap rails, an oxyacetylene torch with a two-flame tip was set up on a radiagraph. At the same time, a hose was attached to the machine so that a small stream of water might be directed on the work about 1 inch behind the flames. A section consisting of one-half of the frog was mounted on skids slightly tilted so that the water would run away from the flames. Two 7-foot sections of radiagraph track were mounted parallel with the flangeway to be treated and fastened securely to the frog and the radiagraph was placed on the tracks so as to run uphill.

Adjust Flame Distance

The torch was lighted and the water turned on, after which, the machine was rolled to within 1 inch of the job and then allowed to proceed under its own power. The operation was then continuous from one end to the other, and the only adjustment necessary was to raise or lower the torch to keep exact distance between the flames and the surface of the metal. The flame had to be kept close enough so that a bright red showed on the steel and yet far enough so that the surface of the steel was not broken. The difference between these two points was so slight that careful regulation was necessary.

As the job progressed, the water which quenched the steel directly behind the flame ran through the flangeway and drained out at the point where the job started. When the end of the job was reached, the machine was stopped and the torch shut off, but the water was allowed to run into the flangeway and back through it until the entire job was thoroughly cooled. Hardness obtained in this manner was a little over 700 brinell, whereas when the flow of water was stopped immediately, the hardness was about 500 brinell.

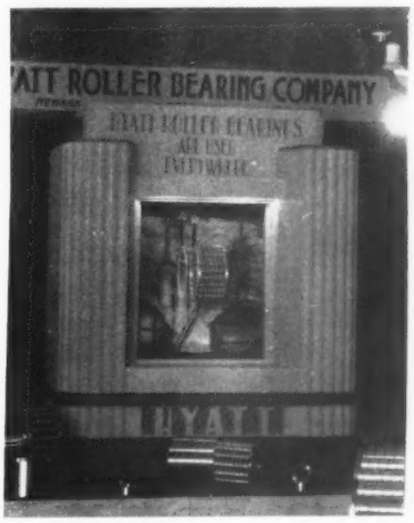
"Old Gold" Smokes Under Hammer—Huddle Called

HOT working of high-molybdenum steels creates an excessive amount of smoke, according to the Ludlum News *of September, published by the Ludlum Steel Co., Watervliet, N. Y. Details are revealed as follows:*

"When we first tried KA2 grade (3 per cent molybdenum) under the 6000-pound hammer, large volumes of smoke appeared. Work was stopped and all the heads and super-heads went into a huddle. Many suggestions materialized but after working this material about four years, the steel still smokes in the working. The boys have named it 'Old Gold.'

"Understanding, however that a recent government investigation shows that molybdenum volatilizes out of the hot scale and not from the steel, the huddles have been discontinued."

Maybe they should have tried the "blind-fold test."



FLOATS IN THE AIR WITH THE GREATEST OF EASE: With sales managers continually cudgeling their brains for novel ideas to attract exposition visitors, here is a mystifying display featured recently by the Hyatt Roller Bearing Co., Harrison, N. J., in its booth at the iron and steel electrical engineers' exposition in Cleveland. The large roller bearing in the center apparently floats in midair to the amazement of visitors, many of whom claimed it was lifted up and down by a concealed magnet, while others were certain a hidden wire did the trick. In reality the bearing is attached to a moving glass background

Penetration of the hardness of the finished job was ¼-inch and the uniformity excellent. Particular attention was directed upon the heat penetration into the web of the rail throughout this job and at no time was it too hot to lay the hand on the juncture of the head and the top of the web; thus there was not sufficient heat penetration to cause any harm.

Speed of advance of the flames ranged from 5½ to 6 inches per minute, depending on the depth of the flangeway, which was deeper in the center than at the ends. Acetylene pressure was 15 pounds and oxygen pressure 20 pounds. Total footage of rail so heat treated was 44 feet 10 inches. Oxygen consumption per foot was 14 cubic feet and acetylene consumption 13 cubic feet. Penetration of hardness was determined by cutting and etching experimental pieces.

S S S

Compound-Gage Strip Rolled

RECENTLY a special machinery builder had an exceedingly difficult problem in the construction of certain small parts for a complicated machine. This machine includes a counting and recording mechanism. The part in question is thicker at one end than the other end and it functions in the machine in much the same way that the tumblers function in a pin tumbler lock. This part, of which several hundred are used in each machine, must be accurate within 0.001-inch. In addition, it must be given a case hardening treatment after forming, in order that it will resist the wear to which it is subjected in the operation of the machine.

From a production standpoint, the volume requirements, as well as the cost requirements, dictated that this part be produced on an automatic power press from strip steel. It proved exceedingly difficult, however, to meet the requirements as to accuracy. The company tried welding a narrow length of thin strip steel along the edge of a wider length of thin strip steel but this method did not work out satisfactorily.

Special Section Rolled

Finally, after combing the cold rolled strip steel makers of the country, it succeeded in getting one mill to produce this strip in two gages as a single rolled section. The strip, as now supplied, is 2½ inches wide. Of this width, 2 inches have thickness of 0.025-inch, while the remaining ½-inch is 0.060-inch thick. As a result of being able to obtain such compound-gage, cold-rolled strip, the

manufacturer's problem in producing this part has been completely solved. This part now is produced on an ordinary, automatic punch-press, at the rate of several hundred per hour, and, because of the accuracy with which the steel manufacturer produces the strip, no further operation is necessary except case-hardening.

S S S

Thin Sheets Cut by Torch

The problem of cutting thin sheet metal with clean edges, and in a place difficult of access, recently was solved by an automobile manufacturer by using an oxyacetylene torch at low pressure. A design change necessitated the insertion of a glove compartment in the instrument panels out of a number of automobiles which already had been completed. A templet was made for the section to be removed and the cutting was done successfully by using 1½ pounds oxygen and 1½ pounds acetylene pressure, with the tip practically up against the metal and following the templet. These low pressures were necessary because if high pressures had been used the piercing of the metal would make holes too irregular to be satisfactory and which would have sealed up with slag.

First Stainless Steel Brew Kettle Shows High Efficiency, Sanitation

WHEN beer became a legalized beverage in the spring of 1933, a new field was opened for manufacturers of tanks, vats and large kettles such as required by the average brewery. Attention was called to this virgin market by STEEL in its issue of March 27, 1933, p. 11, in an article which among other things brought out the value of stainless steel for use in such equipment.

However, buyers of brewery equipment have been slow to adopt stainless steel. They have recognized its high strength, corrosion resistance and ease of cleaning, but have demurred at the high cost. What is claimed to be the first stainless steel brew kettle built in this country only recently was placed in operation at the plant of the Weber-Waukesha Brewing Co., Waukesha, Wis.

Shown in an accompanying illustration, this kettle was fabricated from 10-gage 18-8 chrome-nickel steel by the Cream City Boiler Co., Milwaukee, steel being furnished by the Allegheny Steel Co., Brackenridge, Pa. The kettle is of all-welded construction, insulated with magnesia block and equipped with alloy metal fittings, stainless steel hop strainer and a heating element of three-ring low-pressure stainless coil. Connection to a mash tun is by stainless steel pfaff and grant.

Since its installation the kettle has proved efficient and sanitary. Only 1½ to 2 hours is required to complete the brewing operation, effecting an appreciable saving in fuel. The highly polished exterior surface has a low coefficient of radiation which helps to reduce steam consumption. Proper insulation also aids quick heating and rapid evaporation.

Interior of the kettle is not coated and cleaning is accomplished quickly and easily, according to the brewery management which further reports that because of high strength of the metal, a considerable saving in weight was possible over former designs. Stainless steel has been proved to impart no off-flavor to the beer and to have no effect on color, odor or body.

Installed in a Wisconsin brewery, this 18-8 stainless steel brew kettle presents a striking appearance, cleans quickly and easily and has saved on fuel requirements

Steelmaking Development Increases Tool Life

A process for the manufacture of bessemer screw stock steel, said largely to eliminate abrasive elements in the steel which tend to wear away the cutting edges of tools, has been developed by metallurgists of the Union Drawn Steel Co., Massillon, O. This change has been accomplished, according to the company, without altering analysis and without in any way affecting the physical properties of the material.

While no higher feeds and speeds are claimed beyond those already obtainable with steels of this class, the development is reported to have effected important production economies through extension of tool life and elimination of frequent machine shutdowns for regrinding. Steel processed according to the new technique first was tested carefully by the company's own engineers, showing an increase of from 100 to 400 per cent in tool life. It has since been tried in a number of large screw machine plants where similar favorable results have been reported on long runs where tool wear has been excessive.

The new development is now being employed in the production of both Union free-cut (S.A.E. 1112 type) and Union supercut (high-sulphur) bessemer screw steels, and all steels of these grades now sold by the company are so processed without extra cost to the purchaser.

Soil Acidity Is Held To Be Corrosion Determinant

Corrosion of ferrous metals in acid soils is influenced largely by the acidity of the soil, according to an investigation performed by I. A. Denison and R. B. Hobbs for the national bureau of standards, Washington, reported in research paper 696, available from the bureau, and a part of

the bureau's general study of underground corrosion.

A definite correlation was obtained between the average rates of pitting of ferrous specimens exposed to acid soils for 8 and 10 years and the total acidity of the soils. A similar correlation also was obtained between the total acidity of the soils and losses of weight of steel specimens in a laboratory test. The effect of acidity in inducing corrosion is attributed to its action in preventing the formation of protective layers of ferrous and ferric hydroxides. The pitting factor, defined as the ratio of the maximum depth of pits to the average depth of penetration, is shown to be roughly proportional to the ratio of the uncorroded to corroded areas on a metal surface.

The investigators correlated measurements of several physical properties of soils which determine their permeability with the pitting factor, indicating that the more permeable the soil, exclusive of sands, the greater is the tendency for corrosion to take the form of pitting, other conditions being the same. Certain soils may be so impermeable that the rate of pitting in them is very low.

Railroad Coach Construction Lowers Operating Costs

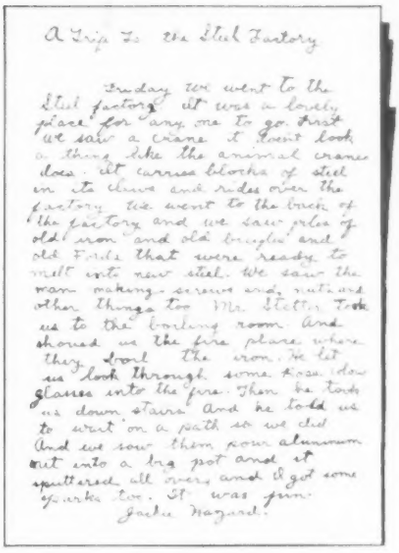
(*Concluded from Page* 34)

vented from penetrating into the flat surfaces of the pans, warping was reduced to a minimum.

No grinding was necessary in finishing the automatic welds. Manual welds were ground down as needed. Welding equipment, including the automatic welder, manual welding machine and electrodes, was supplied by the Lincoln Electric Co., Cleveland.

Every consideration was given to passenger comfort in working out the construction details of these modern passenger coaches. Smoking rooms are unusually commodious. There is a washroom at either end of each coach. Vestibules and steps also are improved to add to the passenger's ease in boarding and leaving the cars. Riding comfort is further increased by a new type of heating and ventilating equipment; also by a new system of rigging for air brakes which reduces noise of operation.

In addition to all arc welded construction, other notable features of these coaches include: Four-wheel cast steel trucks with self-contained brakes and journals mounted in roller bearings; elimination of noise by use of rubber in trucks and other parts; installation of unusually wide plate glass windows; and use of a special compound sprayed over interior metal wall surfaces to deaden noise.



A Trip To the Steel Factory

Sunday we went to the Steel factory it was a lovely place for any one to go. first we saw a crane it don't look a thing like the animal crane does. it carries blocks of steel in its claws and rides over the factory. we went to the back of the factory and we saw piles of old iron and old bicycles and old Fords that were ready to melt into new steel. We saw the men making screws and nuts and other things too. Mr. Stetter took us to the boiling room. And showed us the fire place where they cook the iron. he let us look through some dark glasses into the fire. Then he took us down stairs and he told us to wait on a path so we did. And we saw them pour aluminum out into a big pot and it spattered all over and I got some sparks too. It was fun.

Jackie Hazard

"STEEL FACTORY A LOVELY PLACE": This masterpiece of stark realism, reproduced in facsimile, is from the agile pen of a 7½-year old young lady, who reports her observations of a trip through the plant of the Pacific Coast Steel Co., Los Angeles, in company of a group of her classmates. The "Mr. Stetter" referred to in the essay is G. C. Stetter, metallurgist with the Pacific company, through whose efforts the composition was brought to the public eye. The letter is published here by courtesy of Nickel Steel Topics, published by the International Nickel Co, Inc., New York

Tubes Facilitate Resistance Welding

ELECTRIC discharge tubes for resistance welding were discussed in a paper by Dr. J. Slepian, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., at the recent meeting of the welding engineering division of the Association of Iron and Steel Electrical Engineers at Hotel Statler in Cleveland.

Dr. Slepian pointed out that in modern resistance seam and spot welding practice, a rapid succession of carefully measured and controlled current pulses of high intensity and short duration is used. The great rapidity with which these pulses of current must be switched on and off makes it impractical to produce them by the opening and closing of contacts of a mechanical switch. Electric discharge tubes have great advantages here when used as switching elements.

The speaker described the characteristics and functions of various types of tubes, including the recently developed ignitron, which incorporates a new method for starting a cathode spot almost entirely free from inertia. This tube, the speaker declared, has opened up new fields of applicaion of electric discharge tubes. A .M. Candy, also of the Westinghouse company, assisted Dr. Slepian by describing the operation of welding equipment using electronic tubes.

During discussion of this paper, H. A. Winne, industrial engineering department, General Electric Co., Schenectady, N. Y., pointed out that in connection with electronic tube controlled resistance welding equipment, some factors other than the timing unit itself must be watched. These factors include electrodes, wheels, pressure, etc.

Asserting that the block interval type of demand meter, now in almost universal use in the United States to determine the amount which a user of electric service shall pay for that service, is unsuitable due to its large factor of indefiniteness, Paul M. Lincoln, director, school of electrical engineering, Cornell university, Ithaca, N. Y., urged the use of other types of demand meters.

Dr. Lincoln recommended the recognition of load factor on the basis of some measured quantity instead of an estimated quantity. He suggested a method which would involve payment for a guaranteed load and additional payment for excess power, with rates for both types of power to be arrived at by careful consideration of all factors involved.

Reviews Thermit Welding

The economic importance of thermit welding in steel mill maintenance was the subject of a paper by J. B. Tinnon, manager, thermit department, Metal & Thermit Corp., New York. The speaker described the nature of the thermit reaction, the procedure in making welds and the quality of the weld material. In general, he said, there are three uses for thermit welding in the steel mill, namely: Repair of broken parts, which either because of replacement cost or the element of time, can be salvaged with economy; building up of worn parts; and manufacture of new constructions or making old ones in a new way.

Answering a question as to how to prevent strains and warping resulting from preheating the parts to be welded, Mr. Kinnon stated that the whole piece or assembly should be preheated if this is practicable. Preheating sometimes is started the day before welding. He advocated the use of thermit welding for repairing crane rail joints in crane runways. These joints wear greatly and replacement is difficult. Thermit welded joints, he said, average about $7 each.

Almost any composition of weld metal can be had in thermit welding, Mr. Kinnon declared, by adding the required elements to the mix. The composition is obtained largely as a matter of experience and a knowledge of the effect of various elements.

Investigates Steels Suited For Case Hardening

(American Society for Metals)

PROBLEMS related to heat treatment were considered at the opening technical session of the American Society for Metals held in Hotel Pennsylvania, New York, Monday morning, Oct. 1. Three papers were read and discussed.

Physical properties of case hardened steels were made the subject of a paper by O. W. McMullan, chief metallurgist, Timken-Detroit Axle Co., Detroit. This paper consisted largely of tables, test data and curves derived from investigations of the physical properties of both the case and core of a number of case hardening steels. Tests for hardness, strength of bars in bending, impact of notched and unnotched specimens, distorition, wear resistance, and resistance of the case against crushing, were described.

Several of the more common steels in both fine and coarse grained sizes with low and high carbon cases and some less common steels were used in making the tests. These included S.A.E. 1020, 2315, 2512, 3115, 4615 and five other analyses. The influence of case depth was studied by carburizing specimens to from three to four different depths, all samples being carburized in solid compounds. Three heat treatments were given; a direct quench from the carburizing temperature, referred to as pot or box quenching; cooling in the box followed by a single reheat; and a double treatment.

What Determines Best Steel?

Mr. McMullan stated that a considerable number of case hardening steels is being used for gears as well as other case hardened parts. Some plants have standardized on one or two types of steels for gears, while others are using different types for parts under similar service conditions. There has been considerable discussion and disagreement as to the most suitable grain size to use in any one steel. The same can be said for the carbon content of the case and the depth of the case as well as the method of heat treatment, that is, shall the part be pot quenched, cooled in the pot and reheated once, or given a double treatment?

During the last three years, hundreds of tests have been made on several steels, and while some have not showed much distinction among the various steels nor pointed to any definite conclusions, others have showed very striking differences both in types of steel and methods of heat treatment. The author presented many tables to show both positive and negative results, so that the observer could draw his own conclusions. Naturally, there were some inconsistencies in results, but as many duplicates of tests were made as time permitted.

It was planned to test both fine-grained and coarse-grained steels of each analysis, except the S.A.E. 6115 which could not be obtained coarse grained. The two heats each of S.A.E. 2315 and 4615 were very good examples of fine and coarse-grained heats and the S.A.E. 1020 was reasonably good, but there were scattered coarse grains in the fine grained heat. There was not the desired contrast between the fine and coarse grained heats of S.A.E. 2512 and 3115; both heats of the latter were of mixed grain size. It has been found, said Mr. McMullan, that those heats having a mixed grain size might be termed border line heats, that is, if carburized at a slightly lower temperature they will not exhibit grain growth and will be fine grained, but if carburized higher will develop grain growth and be coarse grained. This explains disagreements in grain size if tests on such heats are not carried out under identical conditions. Time as well as temperature has an important influence.

ON THIS and four succeeding pages appear reports of papers and discussions heard at the National Metal Congress in New York last week, in which six leading technical groups participated. Immediately beneath the headline of each report is given the name of the society to which the ensuing discussion pertains.

Magnetic properties of iron as affected by carbon, oxygen and grain size were considered in a paper by T. D. Yensen, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and N. A. Ziegler, West Penn Electric Co., Pittsburgh. In the research conducted by the two investigators, ring samples of unalloyed iron low in sulphur and phosphorus (less than 0.003 per cent), and with varying quantities of oxygen and carbon prepared from ingots made in a high-frequency induction vacuum furnace, were analyzed carefully for carbon, oxygen and grain size after final annealing and magnetic testing.

After the effect of grain size was eliminated, the effect of oxygen and carbon on the magnetic properties was determined and developed into a ternary diagram, by means of which the net effect of grain size was obtained. According to the authors, it appears that the effect of oxygen on the magnetic properties of iron is very great up to about 0.02 per cent, from which point on the effect become inappreciable up to the limit of the present investigation, about 0.15 per cent. The solubility limit of oxygen was indicated to be about 0.02 per cent, however, certain evidence points to the solubility of oxygen in iron at room temperature as being below 0.01 per cent so that this point requires confirmation.

The effect of carbon is less than previously thought, as part of the effect attributed to carbon is now found to be due to oxygen. Even so, the authors stated, the effect of 0.001 per cent carbon is about ten times that of 0.001 per cent oxygen. This investigation made it more than ever doubtful whether there is a definite solubility limit at 0.006 per cent carbon, as was concluded from an investigation in 1924. It is more probable that carbon—and perhaps also oxygen—is partly in solution and partly precipitated even at very low concentration.

Effect of grain size appears to be proportional to the number of grains per square millimeter, and to vary with the amount of nonmetallic elements present.

How Impurities Affect Structure

Nonmetallic inclusions affect the locus of the primary cementite network in hypereutectoid steels through a mechanism similar to that operating in the precipitation of primary ferrite in hypoeutectoid steels, was the conclusion reached by E. G. Mahin, head of department of metallurgy, and E. F. Lee, graduate of that department in 1934, University of Notre Dame, Notre Dame, Ind., in a paper on this subject. Dissolved impurities are segregated in the austenite zones which are in the immediate vicinity of the inclusions, and these segregated solutes cause the beginning of the primary phase formation before Ar_{cm} is reached for other parts of the solid solution. Probably, this action is due to a diminished thermal hysteresis of the material about the inclusion, due to the presence of the dissolved impurity.

In this investigation, high carbon steel was produced by cementation of ingot iron and wrought iron, nearly carbon-free materials which, in the

process of manufacture, must have given little opportunity for segregation of traces of dissolved impurities, the influence of such segregation upon phase changes being thus eliminated. Pronounced cementite segregation resulted. An explanation for this action was proposed by the authors, taking into consideration the analogous effect in connection with ferrite segregation, and certain suggestions were offered in connection with the effects of carburization of "abnormal" steels.

Pure Science Yields Data of Value on Fe-Cr Alloys

(All Groups)

The following is an abstract of the annual Edward deMille Campbell memorial lecture, delivered Oct. 3 at Hotel Pennsylvania, New York, before combined groups convening at the Nation Metal Congress, by Vsevolod N. Krivobok, professor of metallurgy, Carnegie Institute of Technology, Pittsburgh. The title of Mr. Krivobok's address was "Alloys of Iron and Chromium."

METALLURGY as an art can be traced to the centuries when technological progress was practically unknown. Manuscripts of the fifth and sixth centuries A. D. contain unmistakable references to metallurgical operations performed in great secrecy, often by members of the same clan and thus handed down from generation to generation. At a somewhat later date metallurgical processes appear in literature on alchemy, such as the famous *Doctrine of Democritus* now in the British Museum.

In the ages of conquest and aggression the art of metallurgy was naturally confined to the purpose of warfare. We find in the British Museum, in the Bibliotheque Nationale in Paris, and in other places ancient manuscripts devoted to the description of famous weapons. Often these include a description of the process which was used. Cardanus, for example, recommends the use of "extract of radishes and water that contained earthworms" as a suitable medium for hardening instruments of war. It is really fascinating to realize that our metallurgical predecessors possessed a remarkable knowledge of metallurgical art, without, of course, realizing the fundamental principles of the science.

It was not until the eighteenth and nineteenth centuries that metallurgy became first a branch of technical knowledge and later a science of metals. Edward deMille Campbell, in whose memory this annual memorial lecture is given, was a pioneer in the science of metals.

Progress in scientific metallurgy proceeded in a somewhat haphazard manner. Much work—accumulating data, describing various processes and the like—has been done, but only during the last 25 or 30 years have we realized the dependence of metallurgical problems upon the principles of chemistry and physics. The present lecture deals with one of the very important topics, noncorrosive and heat-resisting alloys of iron and chromium, and attempts to show how scientific research based on the above mentioned principles of pure science can yield information of utmost value to industrial progress.

It is well known by scientists that various properties of metals and alloys depend upon the latter's composition, treatment, and the conditions under which these alloys or metals are to serve. In the lecture each one of these topics is discussed separately, presenting new information secured in the laboratories of the Carnegie Institute of Technology, Pittsburgh.

Composition

Although the question of composition has been most extensively studied, the possible influence of some gaseous elements as, for example, nitrogen, common element of the air, has never been shown. The author's researches conducted over a period of three years prove that, first, nitrogen has profound influence on the properties of stainless steels, and also, that iron and chromium (stainless) steels have a remarkable affinity for nitrogen. While pure iron will dissolve (or absorb) no more than 0.004-0.01 per cent of N_2, alloys of iron *and chromium* can take up as much as 1.5 per cent of nitrogen, depending upon the chromium content. Furthermore, these alloys absorb nitrogen most readily, for example by simple remelting under nitrogen atmosphere.

What proves to be even more interesting is that one does not need much nitrogen in alloys in order to produce astonishing changes in properties. As little as 0.2 per cent of N_2 (by weight) imparts to alloys the power of hardening, something that similar alloys without nitrogen do not have (in the absence of carbon). Thus hardness and other mechanical properties can be radically changed by controlling nitrogen contents,—a fact heretofore unknown to metallurgists. Since this investigation of influence of nitrogen on the properties of special alloys discloses facts of primary importance, the influence of nitrogen on other alloys as well as on other properties of chromium alloys should prove to be important to scientists as well as manufacturers.

Physico-Chemical Phenomena

The properties of metals and alloys depend, besides upon their composition, upon the treatment such metals receive. The treatment, in turn, is governed by physico-chemical phenomena. To harden ordinary steel, it must first be heated, thus changing its structural constituents, and then rapidly cooled. Rapid cooling preserves those structural constituents which impart certain properties such as hardness, for example. The speed (or rate) of cooling, is therefore, of utmost importance. This has been fully realized by scientists and this particular branch of metallurgical knowledge is known as the study of the rates of reactions. In many instances we wish to preclude the possibility of a certain reaction taking place, accomplishing this by such rapid cooling that the pre-heated article reaches room temperature almost instantaneously.

Unfortunately, however, some of the reactions will proceed even at room temperature, in the course of long time. Stainless steels (iron-chromium-carbon alloys) have been found to possess certain peculiar characteristics which could not be explained either by their composition or by the heat treatment they have received. The present research discloses the presence of processes of transformation of one constituent of steel into another; such processes taking place very slowly, but being much accelerated by reheating to even relatively low temperatures. In many cases ductility (softness) is required in heat-resisting alloys for ease in fabrication of various articles. It was disclosed that such steels, however, *do not maintain* their properties, even at room temperature but undergo gradual changes in their properties. An increase in hardness up to 25-30 per cent of original was noticed, because of the so-called "process of precipitation hardening," a process which is suppressed by rapid cooling, but which asserts itself under favorable conditions such as even slight increase in temperature at which the steel is to serve. The understanding of this and other phenomena should

be useful in understanding and combating many of the heretofore unexplainable difficulties encountered in fabrication of stainless and similar steels.

Nature of the Alloys

Although great progress in scientific metallurgy has been made, many phenomena remain as yet unsolved. There is but little doubt that some of these phenomena are associated with the manner in which atoms of various elements bond together in forming an alloy.

A most peculiar behavior was discovered in the studied iron-chromium alloys, namely the dependence of their properties upon the temperature of the test. For example, either unbelievable brittleness, comparable with that of glass, or equally astonishing ductility can be obtained by varying the temperature of test only 40 or 50 degrees Cent. The lecture establishes the fact that such an anomaly is *not* the permanent change. That is to say, an alloy tested at 50 degrees Cent. will be ductile while at 0 degrees it is brittle. Refrigerated to 0 degrees Cent. and tested again at 50 degrees Cent. it will regain its ductility. The phenomenon, thus, must be associated with the character and magnitude of forces that bind the atoms at various temperatures; consequently these forces must be greatly influenced by temperature.

Thus the lecture as a whole takes a specific subject, important from industrial, humanitarian and artistic points of view and applies to it the methods of modern research, uncovering fundamental principles governing the properties and behavior of these alloys, and finally pointing out the possible applications of discovered facts to the problems of industries.

Making Welds To Withstand Severe Impact Stresses

(American Welding Society)

IN DESIGNING a pile would you weld it? Would welds withstand the impact stresses to which a pile is subjected? These questions were answered in the affirmative in a voluminous paper submitted by W. Spraragen, secretary, American bureau of welding, at the opening session of the fall meeting of the American Welding society in New York, Oct. 1.

After spending months in studying all data on impact studies of welds that has been published in recent years, including translations of literature published abroad, Mr. Spraragen reached certain conclusions. He stated, however, that he reached them hesitantly, for the reason that many papers studied contained meager data, while many made no allowance for important variables.

His conclusions were as follows: Welds easily may be made to withstand severe impact stresses; welds with high impact value may best be made by using mild or low carbon steel, and following a procedure which will produce good, ductile welds, free from porosity; best results in impact values are obtained by using coated rather than bare rods; heat treatment cannot be relied on to improve welds, as existing data show some welds are improved by heat treatment while others deteriorate after heat treatment.

Some faults in present test methods were criticized by Mr. Spraragen. It is unfortunate, he said, that test pieces generally are notched. Such procedure results in concentrations of stresses so that resulting data are not accurately indicative of the physical values. Then, results obtained on the usual small test pieces are not accurate indicators as to the characteristics of large structures. He stressed the fact that in reaching his conclusions he took into account all the information he could obtain as to impact values of large welded structures such as ships, bridges, cranes and the like.

Welds Hold in Ship Plates

Mr. Spraragen cited the case of a welded ship squeezed between icebergs; the pressure caused the deck to buckle and raise 18 inches above its normal plane, but the welds underwent no damage. Another, loaded with bags of cement, went aground and her hull plates were badly bent but the cement remained dry and the plates later were bent back to shape. He mentioned 10 piles made of longitudinally welded pipe which stood up under the service for which they were designed; another similar pile failed and when investigated was found to have faulty welds with poor penetration. He mentioned a welded steel staircase in South Africa on which a bag of stone was dropped from a height of 8 feet; the treads were bent so as to draw in the stringers but there were no weld failures.

To obtain impact resisting welds, Mr. Spraragen warned against the use of bare wire, saying resulting welds have low impact values; furthermore, they cannot be improved by heat treatment. Welds made by using coated rods or by employing the atomic hydrogen method, on the other hand, have impact values approaching those of the parent mild steel.

In discussing Mr. Spraragen's paper, F. T. Llewellyn, United States Steel Corp., cited the case of industrial cars used for hauling limestone. Bottom plates of these cars were riveted or welded together and there were numerous failures of both types of joints so that there was a fair amount of time-loss due to necessity of making repairs. Straps were inserted in the ends of the plates and welded. When the straps were welded at the ends—that is, at right angles to the stress set up by loading the limestone into the cars, the welds developed failures. But when they were welded at the sides, in line with the direction of the impact stress, there was an end to the failures.

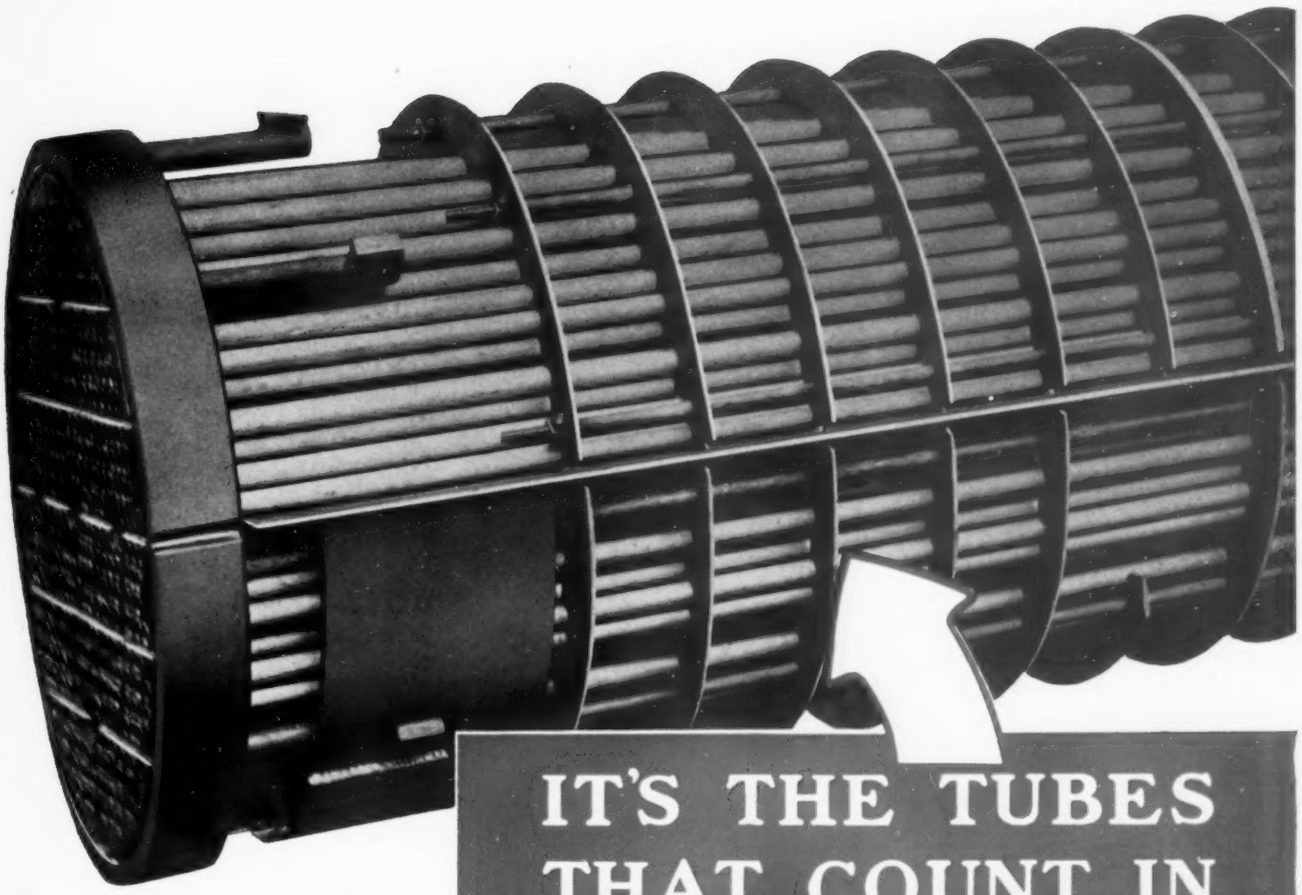
When the CHICAGO this year was rammed by a merchant vessel on the west coast, nearly cutting her in two, subsequent examination showed that no weld in the vessel failed as a result of the terrific impact stresses set up, according to L. C. Bibber, navy department. Neither was there any failure of the base metal due to welding.

Sees Value in Peening

J. W. Owens, National Weld Testing bureau, Pittsburgh, in discussing this paper, went into some detail on the value of peening welds. He expressed the belief that peening helps to relieve stresses in welds. But he declared that the last layer of a weld never under any circumstances should be peened. Such peening of the final layer, he warned, sets up incipient cracks which are apt to prove fatal to the weld impast value.

F. T. Llewellyn presented a paper which went into great detail as to factors involved in building steel residences. The principal advantage in using steel for construction of residences, he said, is that this material does not shrink. Its use, therefore, simplifies construction. He set forth much engineering data on design of studs, desirable ratio of steel to other materials, the classification of steel wall framing and other points.

The average room contains about 300 square feet, said Mr. Llewellyn, and steel wall framing for such a rooms costs about $125 on the average. He warned against a too-optimistic view in regard to the future for steel residences, saying steel will be used only where required. Too, he thought that welding of such resi-



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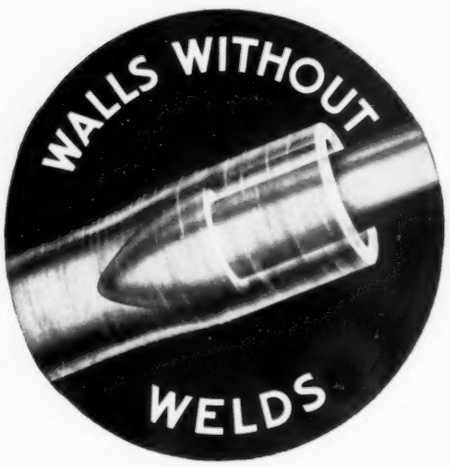

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dences largely will be restricted to such welding as can be done at the fabricating field.

J. C. Lincoln, chairman, Lincoln Electric Co., Cleveland, told of a newly developed nail which in effect works like a drive-screw. It penetrates steel plates ⅛-inch thick, and Mr. Lincoln thought this development might assist the use of steel for the construction of residences.

It is necessary, in designing any steel structure, to avoid rapid changes in cross section, according to Mr. Lincoln, in summarizing a paper by E. W. P. Smith, Lincoln Electric Co. on the "Use of Polarized Light as Applied to Welding Products." In general, said Mr. Lincoln, lines should be made smooth and easy. The use of polarized light, he said, is a help in locating stress concentrations on celluloid specimens. Its use makes it readily apparent how much more uniformly distributed are the stress lines in a properly designed piece than in one improperly designed.

Announces New Process for Cleaning of Metals

(Wire Association)

SIX years ago an electrolytic galvanizing process was developed at Kellogg, Idaho, using a high current density and a strong acidulated electrolyte. Zinc produced is 99.995 per cent pure. The first application of this process in the wire industry has been made at a plant in New England states. This was announced at the opening technical session of the Wire association by U. C. Tainton, consulting metallurgical engineer, Baltimore. The process as used by the wire producer is identical with the pure metal except that the zinc is deposited directly on the article to be plated.

Raw material may be any zinc bearing substance, he continued, but usually it is roasted zinc concentrate. This is dissolved in the return electrolyte coming from the cells which contains about 250 grams per liter of free acid. This dissolves the zinc, copper, cadmium, etc., leaving a residue containing iron, silica, lead and other solids, he explained. The solution then is purified and goes forward to the cells where it is electrolyzed using anodes of silver-lead alloy and cathodes of wire being coated. This results in the deposition on the wire of a uniform layer of high-purity zinc which can be carried to any desired thickness.

Cleaned Surface Resists Rust

The active cleaning agent, the speaker stated, is nascent metallic sodium. This is liberated at the surface of the article by electrolysis in the bath of fused sodium salt. On account of the intense affinity of sodium for oxygen, it will reduce back to metal on any ordinary oxidized metal surface regardless of its composition.

At the mill in question, the wire on its way to each galvanizing cell passes through a steel trough containing fused sodium hydroxide and carbonate. The wire is made the cathode and this results in the liberation of nascent sodium metal which reduces the oxide back to metallic iron. Other impurities such as sulphur, silicon and carbon, are removed. The resultant clean surface consists of substantially pure iron and is much less subject to rusting than steel pickled with acid.

Some of the advantages cited by the speaker were a cleaner and more uniform surface, better coatings, no waste acid, no loss of steel, no embrittlement, steel may be given heat treatment while being cleaned, no degreasing necessary, no sandblasting required, and the steel can be stored without rusting. The normal power requirements range from 5 to 20 kilowatt-hours per ton of metal cleaned and 1 gallon of fuel oil or its equivalent per ton of steel heated.

What Is Best Temperature?

Discussion brought out the fact that the salt bath is operated at any temperature above the fusion point of the salt. Experimentally, the bath has been operated at 1650 degrees Fahr. While it is feasible to combine the annealing and cleaning operations, the best practice when using sodium hydroxide is to operate at a temperature above 1200 degrees Fahr. to avoid the direct attack of the metal by the solution.

In discussing "Corrosion and Hot Galvanizing of Iron and Steel" A. B. Dove, chemical engineer, Steel Co. of Canada Ltd., Hamilton, Ont., mentioned that in the last 14 years more attention has been focused on the scientific control and operation of the galvanizing process. As a general rule, he stated, wire carries little scale so that the pickling operation resolves itself into a mere dissolution of light oxides and iron. Maintaining the pickling solution at a low temperature and strength, he contended, obviates gas bubbles which tend to expand and form humps beneath the zinc coating.

The breakage of galvanizing coatings in bending the speaker traced to the brittle nature of three complex alloys of zinc and iron and explained that the only method of increasing the bending properties of these brittle alloys aside from galvannealing, is to reduce their depth. He pointed out that there is a temperature at which the alloy layer has a minimum thickness and that this varies with the speed of operation.

In discussing the effect of high carbon content on galvanizing, Mr. Dove stated that difficulty increases as the base metal approaches pure iron. When a number of surface elements dissolve at a different rate in molten zinc there results a microscopic etching of the elements that tend to lock in the coating.

One member of the association was of the opinion that silicon, carbon and phosphorus increased the efficiency of galvanizing and he mentioned that a French authority recently claimed that phosphorus and sulphur interferes with galvanizing. Opinions voiced by various wiremakers did not substantiate the contention that sulphur has a detrimental effect on the coating process. Rimmed basic open-hearth steel will not galvanize as readily as killed steel, the carbon content being the same for both grades, according to one speaker.

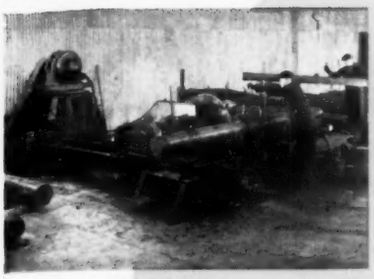
Choice of Flux Important

The use of ammonium chloride as a flux gradually is being abandoned in favor of various compounds, according to a metallurgist. He was of the opinion that zinc ammonium chloride gives good results but has certain disadvantages. The addition of ½ per cent glycerine to ammonium chloride flux will afford satisfactory results, according to an operator.

The object of a flux, stated an authority on cleaning, is to keep clean steel clean, and he emphasized that the crux of the whole process is the washing operation after pickling is completed. Another member pointed out that in the use of prepared fluxes the main objection is that part of the flux is carried over and thus causes difficulty in the wiping operation.

In reply to the question, "Is it customary in the production of extra galvanized wire to run the bath at a lower temperature than for wipe wire?" it was brought out that slightly higher temperatures will result in smoother coatings on the extra galvanized wire. On the larger sizes of wire it is best to run at a higher temperature in order to se-

FRICTION SAW



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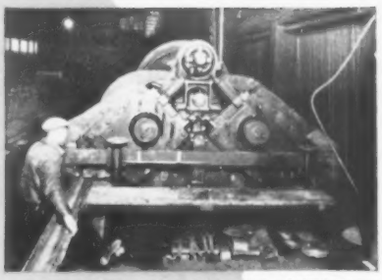
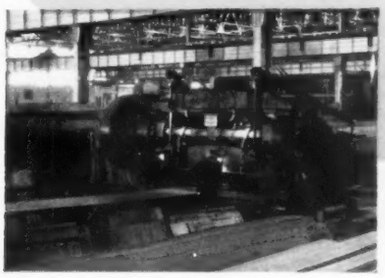


TWIN BLADE ANGLE SHEAR

BENDING EQUIPMENT

OXYGRAPH CUTTING MACHINE



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cure the proper coating, an operator contended.

In using charcoal in the header box it is essential to know whether the product has been made from soft or hard wood. Some plants use powdered and some granulated (⅛ to ¼-inch mesh). Further discussion developed the fact that charcoal does not stick to wire unless it becomes too hot.

One wiremaker, in discussing suitable covers for galvanizing pans which will reduce the production of ash, mentioned that his plant formerly used metal covers, then coke breeze and finally diatomaceous earth. One wire producer by using this latter material encountered a carry-over particularly when employing a shallow pan about 1 foot deep and with the wire going down about 6 inches. Another producer declared that practice at his plant is to use silocel for insulation purposes and to prevent oxidation.

Discuss Wear of Rolls

A paper entitled "Smelting, Casting and Rolling Electrolytic Copper," prepared by R. H. Miller, assistant superintendent of refineries, Anaconda Copper Mining Co., and W. S. Adams, superintendent rolling mills, Anaconda Wire & Cable Co., Great Falls, Mont., described the concentration of milling, refining, oxidation, melting, casting, material handling, hot rolling, specifications, testing and scrap reclamation. In the symposium which followed, steel rolls were compared with cast-iron rolls from the standpoint of wearing qualities. One producer emphasized that in the drawing of fine copper wire hardened rolls are not satisfactory no matter how highly they are polished until after they have been in service for a few hours. Cast-iron rolls came in for favorable choice, particularly those capable of attaining a high polish and glaze. One wiremaker stated best results were obtained at his plant by the use of 6-inch hardened steel chromium plated rolls.

A paper entitled "Lubrication for Drawing Copper Wire in Three Stages," by J. G. Richards, wire mill lubricating engineer, Philadelphia, was read by proxy.

In high-speed drawing, lubricants and dies should be considered as a unit since one is just as important as the other, stated a member. Use of a high-speed drawing lubricant was discouraged in the case of drawing fine wire on account of its stickiness. A thin clean dip was recommended for drawing fine copper wire by one producer who cautioned that a heavy or tacky dip will cause the wire to grip the rolls and result in idle machine time.

In discussing the quality of lubricants for producing extra bright wire at high speeds one maker stated that good results are had by using a good grade having a potassium base. The machines, he stated, are kept free from soap and brighter wire is obtained.

Metallurgists and Designers Aid Die Casting Progress

(Institute of Metals Division, A. I. M. E.)

SUCCESSFUL development of brass die castings has resulted from the availability of alloy steels which give satisfactory life as dies, and the development of suitable die casting machines. This tribute to metallurgy and mechanical design was expressed by John R. Freeman Jr., American Brass Co., Waterbury, Conn., in his discussion on die castings of brass before the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers at the annual meeting in New York. The paper related entirely to the casting of brass under fluid pressure in steel dies. The development of brass die castings has been relatively recent, occurring within the past five years.

Referring to the types of die casting machines, he explained that in the well-known plunger and goose-neck types employed for casting alloys of relatively lower melting point, much of the working mechanism is immersed in the molten alloy. For alloys having the relatively high melting point of brass this obviously is impossible. Machines with a separate melting chamber are essential. Two rather distinct types in extensive use were pointed out by Mr. Freeman. They are the Pack and Polak machines, the former designed by Charles Pack and developed at the American Brass Co. and the latter developed by Joseph Polak of Prague, Czechoslovakia.

In both types of machines the metal to be cast is maintained at proper casting temperature in a holding pot, from which it is ladled in required amounts into the cup or pressure chamber of the unit. They differ however in principle. Alloys that may be die cast commercially in either of the two types of machines are limited only by the melting point and consequent casting temperature required. At the present time the higher melting point alloys cannot be cast due to limitations of die steels available.

Brass of a composition of 60 per cent copper and 40 per cent zinc has the lowest melting point of the commercial brasses and for this reason is the most widely used for the manufacture of brass die castings. Other elements, however, are added to obtain certain characteristics more or less peculiar to the die casting process. The plastic range of the high brasses is quite narrow but may be greatly increased by the addition of a small percentage of lead due to its immiscibility in the molten condition in the brass alloy. For satisfactory operation in the Polak machine a minimum of about one-half per cent is required. Lead also, as is well known, confers machinability upon brass. However, it markedly reduces ductility and in excess introduces hot shortness.

Composition of Preferred Alloys

The alloys, according to Mr. Freeman, most suitable for general die casting purposes in both types of machines have the following nominal composition: Copper 60 per cent, tin 1 per cent, lead 1 per cent, remainder zinc and not over 0.10 per cent aluminum. Its tensile strength is 55,000 pounds per square inch and elongation 9 per cent in 2 inches. In addition to the common brasses certain high silicon alloys have been found eminently suited for die castings having low melting point—about 900 degrees Cent.—good fluidity and unusually high strength. A satisfactory alloy of this type is composed of 81.50 per cent copper, 4.25 per cent silicon, 0.15 per cent manganese and remainder zinc. Tensile strength is 85,000 pounds per square inch and 8 per cent elongation in 2 inches.

Brass die castings occupy a position between brass forgings or die pressings and sand castings. They are supplemental to die pressings rather than competitive, although they may at times be substituted for the latter, particularly where coring will eliminate extensive machining operations. They make available complicated shapes with rather intricate coring, cast to more precise dimensions than sand castings and with superior surface finish, he declared. Die cast brass fittings have been subjected to hydrostatic pressures as high as 800 pounds per square inch without showing distress or leakage.

The technical paper following this

(*Please turn to Page* 62)

Here is shown an interesting section in the steel and alloys section of the National Metal exposition. All exhibits were located on one floor

Highlights of Exhibits at the SIXTEENTH NATIONAL METAL SHOW

PRONOUNCED one of the finest expositions ever staged by the American Society for Metals, the Sixteenth National Metal exposition unfolded for visitors a splendid array of products and equipment used in the metal industries, much of it shown for the first time. Attendance at the Port of Authority building, New York, scene of the show, was heavy during the five days the exposition was open. Facilities for exhibits, such as space, light and ventilation were declared unmatched by any previous show. Nearly 200 companies participated.

Many miniatures of equipment used for rolling, drawing and heat treating steel were displayed by steelmakers. In the booth of the Bethlehem Steel Co., Bethlehem, Pa., three models of heat treating equipment were operated. One was a preheating and high-temperature furnace showing how 26,000 pounds of 8-inch rounds is handled an hour; another a pit quenching furnace showing how 6000 pounds of 2-inch rounds is handled an hour; and a car-bottom tempering furnace which handles 25,000 pounds per charge. In a separate section the company showed a heat treated car wheel in various stages of manufacture and treatment, with a background of transparencies of views in the new car wheel department at the Johnstown division.

A feature of the exhibit of the Youngstown Sheet & Tube Co., Youngstown, O., was a complete operating scale model of the latest type buttweld pipe mill and a working model of the Nullmeyer wire drawing block. An attractive background was formed by various hand-colored transparencies incident to the manufacturing of steel. A large piece of 6¼-inch, 13-pound casing removed from one of the oldest wells near Middletown, O., after 21 years service was displayed as well as copper-coated and liquor-finished wire.

Blooming Mill Model Run

A background for the products shown at the booth of the Jones & Laughlin Steel Corp., Pittsburgh, was a large model of a 2-high 40-inch blooming mill. A miniature ingot from the soaking pits was conveyed over the approach table into the bloomer where it was given several passes and then taken away by a runout table. Supplementary side panels contained illuminated murals, depicting bessemer and open-hearth steelmaking. Various products exhibited by the company included hot and cold finished Jalcase steel, improved bessemer screw stock, normalized cold heading wire, spring wire, shafting, cold rolled flats, shapes, tubular and tin mill products, structural shapes and bars.

At the booth of the United States Steel Corp., New York, various products made by its subsidiary companies were shown. The Carnegie Steel Co., Pittsburgh, had a heat treating demonstration of various grades of carbon steels in the form of talking pictures. It also displayed a group of test fractures depicting the grain and hardening characteristics of controlled steels. Illuminated macrostructures illustrated the grain characteristics of fine and coarse grain steels at 50-degree intervals from 1400 to 2000 degrees Fahr.

Actual demonstrations of welding were made at the section occupied by the American Steel & Wire Co., Chicago. It also showed manufacturing wires, cold-rolled strip, springs and cold-finished steel bars of carbon, alloy and stainless qualities. A cutaway section of a heat exchanger made with stainless tubes featured the exhibit of the National Tube Co., Pittsburgh, which also had on display the new Wallace-type joint for stainless pipe and tubular products and various samples of stainless pipe and tubing. Illinois Steel Co., Chicago, showed Plykrome stainless-clad steels as well as merchant shapes and heat resisting steels. Stainless beer barrels and kegs, shot-welded sections and automotive parts were included in the display of the American Sheet & Tin Plate Co., Pittsburgh.

A large stainless steel etching of President Roosevelt was displayed at the booth of the Republic Steel Corp., Youngstown, O. This company also had available for inspection alloy, stainless and heat-resisting steels and copper-molybdenum iron in the form of transmission and differential gears, forgings, ball and roller bearings, airplane parts, tubing, sheets, strip, cold drawn shapes, bolts, nuts, architectural sections, kitchen utensils and other commodities fabricated for the textile, dairy, brewing, canning and other leading industries. Centrally located in the

Use these low-upkeep d-c. motors and control for your tough steel-mill jobs

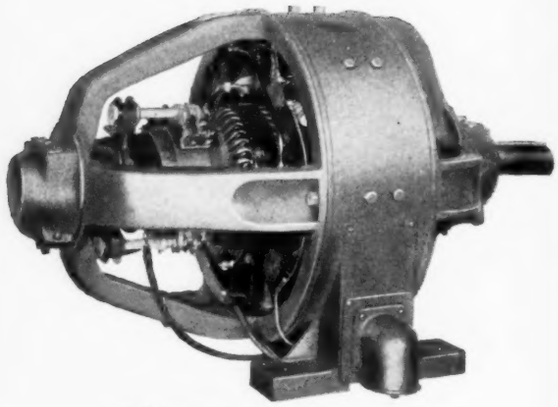
Wherever you need a general-purpose d-c. motor that can be depended on for a long life of trouble-free, economical service, use a G-E Type B or Type CD. Performance records of these motors in hundreds of tough steel-mill jobs have proved their reliability.

Sturdy, husky, well-built, and embodying many new refinements of design and construction, Types B and CD are readily adapted to a wide range of uses in your mill. Enclosures and fittings are easily modified to meet special operating conditions.

These motors are available for either constant- or adjustable-speed drives, in sizes from 1/2 to 200 hp. For locations where dust, dirt, moisture, and other foreign matter are present in large quantities, totally enclosed, fan-cooled models can be used.

Built to stand steel-mill service, the general-purpose CR-4231 magnetic starters, of which the well-known G-E magnetic time-delay system of acceleration is a feature, will assure dependable control and protection for your d-c. motors.

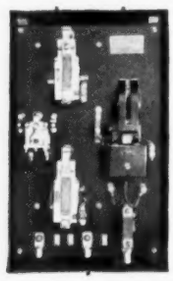
Learn more about this mill equipment that will give you years of reliable service. For complete information, address the steel-mill specialist in the nearest G-E sales office, or General Electric, Dept. 6C-201, Schenectady, N. Y.



G-E Type CD direct-current motor

G-E Type B direct-current motor

G-E Type B totally enclosed, fan-cooled motor, also available in Type CD



G-E CR4231 mill-type starter, with cover removed

008-11

GENERAL ELECTRIC

company's booth was a rest room built of Enduro rust-resisting metal.

Sample cases of wire rope and fittings, strip steel, bare and insulated copper wire and wire cloth formed an attractive part of the exhibit of John A. Roebling's Sons Co., Trenton, N. J. Various sizes of the company's no-pinch wedge sockets for wire rope cables also were shown.

To demonstrate wire conveyor belts, the Wickwire Spencer Steel Co., New York, operated a miniature heat treating furnace with a section cut away. It also displayed wires and various types of springs adapted to the requirements of the automotive industry, including stainless steel, black oil tempered, music, shaped and rope wire.

Various views of forgings in process of manufacture in the shops of the Midvale Co., Philadelphia, were shown continuously at its booth by a balopticon. Also available for inspection were large photographs of various manufacturing operations within the company's plant.

PRODUCTS made from Allegheny metal were shown at the booth of the Allegheny Steel Co., Brackenridge, Pa., including watch cases, chain, knives and forks, screws and nuts—all attractively arranged in plush-lined cases. In the background of the booth were portrayed leading industries such as building construction, transportation, beverage dispensing, food handling, chemical processing, dairy and hospital, which use the company's stainless steels.

Tool and alloy steels were featured at the booth of Joseph T. Ryerson & Sons Inc., Chicago. The company also had on display such commodities as welding wire, cold finished steels, 18-8 steels in the form of rolled and alloy and heat-resisting castings, flame-cut hot-rolled steel plates, abrasive-resisting steel plates, welding rods and bearing metal.

Shenango-Penn Mold Co., Pittsburgh, showed centrifugally cast bronzes and nonferrous alloys in the form of bushings, bearings, sleeves and rolls.

Numerous sections of split steel ingots were attractively displayed at the booth of the Gathmann Engineering Co., Baltimore. One was a central section of rimming steel ingot made in a 21½ x 23½-inch Gathmann-type mold. A working model of the company's ingot mold stripper was shown in operation.

Tool steel of various alloy grades and cast to shape constituted the principal items displayed at the booth of the Detroit Alloy Steel Co., Detroit.

Wheelock, Lovejoy & Co. Inc., Cambridge, Mass., showed machine parts made from the company's alloy steels. In the background and extending the full length of the booth was a large painting depicting a steelworks, blast furnaces, ore boats and in the foreground a view of the company's warehouses, heat treating department and the machine and forge shop.

Great Lakes Steel Co., Detroit, featured two murals—one of an open-hearth tapping scene and the other of soaking pits—and a motion picture showing the manufacture of steel from the ore mines to the finished sheet. It also displayed various sections of special merchant shapes mounted on a revolving panels.

Heppenstall Co., Pittsburgh, had its booth equipped for the entertainment of visitors rather than for the display of its products.

Special Steels Featured

A variety of steels was shown by H. Boker & Co. Inc., New York, including stainless-clad, cobalt, stainless and die steels, the latter in the form of bar stock and cast to shape.

Various machine parts and equipment made from special steels were exhibited by Brown-Wales Co., Boston, and Horace T. Potts Co., Philadelphia. A. Milne & Co., New York, featured an iron fibered steel manufactured by Edgar Allen & Co. Ltd., England, as well as a miscellaneous line of high-speed steels. Quality steels for mechanical purposes, steel tubing, strip, sheet, tool steel and welding wire were displayed by Peter A. Frasse & Co. Inc., New York. Universal Steel Co., Bridgeville, Pa., had a display of Steckel mill rolls used two years for rolling high-carbon and stainless steels as well as drills and milling cutters.

Samples of various ferroalloys and metals constituted the principal items at the booth of the Electro Metallurgical Co., New York. Visual applications of the company's products were demonstrated. Vanadium Corp. of America, New York, displayed photomicrograph transparencies showing the influence of vanadium on steels, and had gears and castings available for inspection. A chrome-nickel steel roll deoxidized with ferro-carbon-titanium, tin plate treated with titanium, various photographs of deoxidized steel castings and samples of titanium constituted the principal items shown at the booth of the Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

Numerous industrial applications of nickel alloy steels, monel metal, nickel cast iron and nickel bronzes such as aircraft engine forgings, an automobile transmission, carburized parts, nickel-clad steel plate, in addition to samples of nickel ore, shot, matte and nickel silver commodities attracted attention at the booth of the International Nickel Co. Inc., New York.

Climax Molybdenum Co., New York, featured at its booth a cutaway section of a 0.70 per cent molybdenum iron cylinder block and a wall display illustrating the effect of this element on the physical properties of iron and steel. A miniature draw bench in operation at this booth produced chrome molybdenum steel tubing, effecting a 12 per cent reduction per draw.

Molybdenum Corp. of America, Pittsburgh, showed a model of a camp townsite, the interior of a molybdenum mine and a plant for refining the ore. It also has available for inspection samples of chrome powder, electrolytic tin, lead powder and molybdenum powder.

OPERATING a high-speed furnace, the Vapofier Corp., Chicago, displayed a vapofier with knocked down parts of the unit, showing simplicity of assembly and efficiency of the equipment. The

A large and important section of the National Metal exposition was devoted to furnaces, ovens, burners and other appliances using gas as fuel

unit is completely automatic in operation, demonstrated by using a Brown temperature recording instrument and running with Minneapolis-Honeywell motor-operated valves.

Showing the method of mounting its electric heating elements, Globar Corp., Niagara Falls, N. Y., displayed a furnace cross section, illustrating details of installation with photographs of units already operating at various plants. The display also included a small high-temperature electric heating element in operation.

Hauck Mfg. Co., Brooklyn, N. Y., featured high and low pressure gas and oil burners, including among the latter triple atomizing low pressure oil burners, combination low pressure air and steam atomizing burners, flame burners, suction torches, oil strainers and oil regulating valves, the latter being a new development by the company.

In addition to systems of automatic controls for heat treating furnaces and ovens, Minneapolis-Honeywell Regulator Co., Minneapolis, stressed a control for its modutrol system for air conditioning. Automatic control of industrial furnace temperatures and atmospheres, a proportioning system of such control, was also featured. Motorized safety shut-off valves and temperature, pressure, humidity and safety controls were shown, also relays, mercury switches and water level controls.

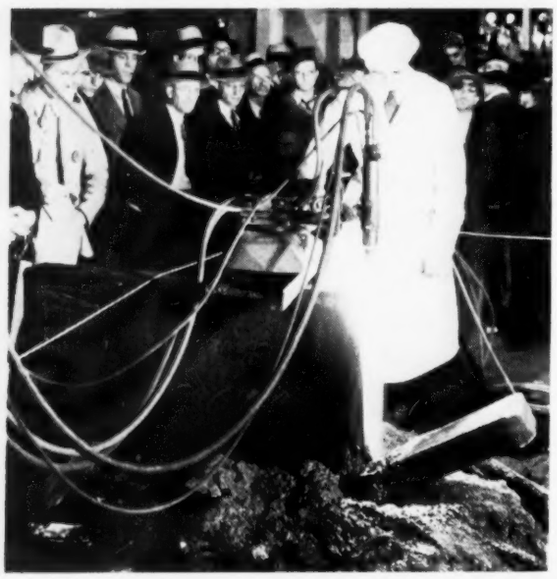
The Bristol Co., Waterbury, Conn., featured the B-linator, a control device which works with commonly used makes of pyrometer controllers equipped with two or more contacts, a unit which may be added to present control installations of fuel control apparatus on oil, gas and electric heated furnaces. This unit through a switching device adds or subtracts a voltage to the regular thermocouple circuit to cause the controller to act in anticipation of a temperature change.

An auxiliary control for minimizing the effects of temperature lags was shown by the Foxboro Co., Foxboro, Mass. This device, a controlling pryometer and a recording pyrometer were shown controlling and recording temperatures in an electric furnace. A gage board containing multiple potentiometer record pyrometer controls, tapalogs, pickling tank controllers, indicating pyrometers, tempering, bath thermometers and other heat treating instruments were displayed.

Leeds & Northrup Co., Philadelphia, showing pyrometers, electric furnaces and control equipment, stressed the Hump method for hardening, a triple control of furnace atmosphere, rate of heating and positive control of the quench point above the critical. There is a minimum distortion in hardening with little refinishing required after heat treatment of the tool or die with no scaling, pitting or decarburization, it is claimed. Protective pack hardening or coating is not required.

A new optical pyrometer with three separate, direct reading scales attracted much attention in the exhibit of the Pyrometer Instrument

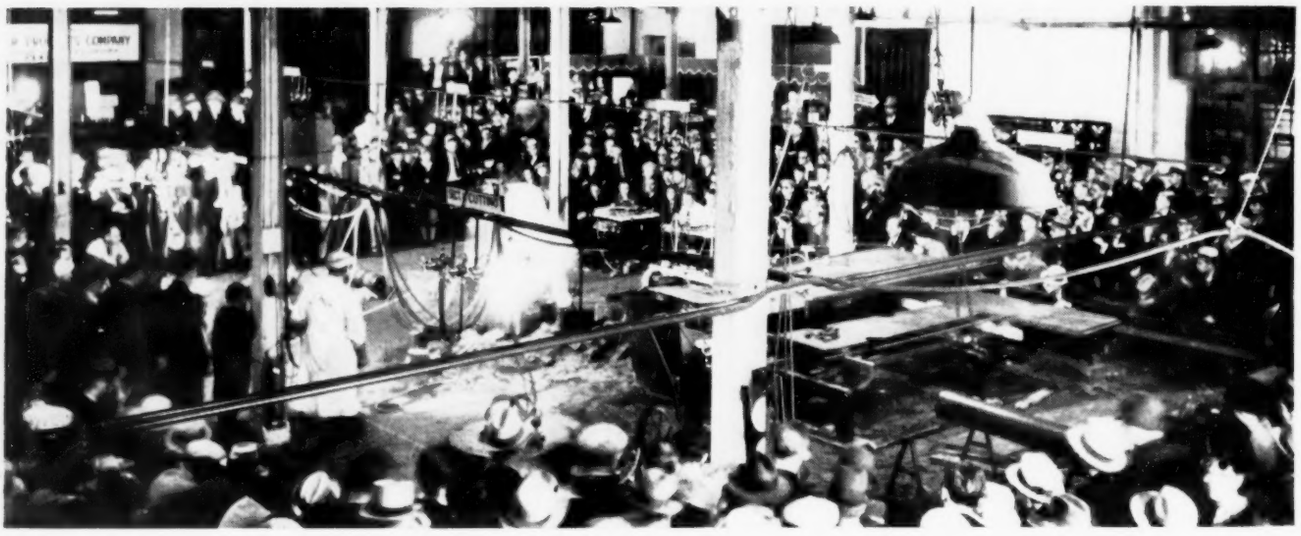
(*Please turn to Page* 62)



Welding Clinic Draws Throngs

OVER 2000 attended the three-day welding clinic held in Cleveland Sept. 27-29 by the Linde Air Products Co., under direction of the Cleveland district office of the company. Below is shown a section of the crowd watching a steel cutting demonstration. The machine used in this demonstration, a close-up view of which is shown at the left, is a newly developed device known as the Oxweld monitor-type cutting machine. It is a portable unit, operated on 40 pounds oxygen pressure and capable of cutting through 24 inches of steel. Speed of the cutting torch may be varied from slow (1 to 2 inches per minute) to higher speeds such as might be required for deseaming operations. It is reversible and equipped with gearshift and "freewheeling" arrangement. It is possible to mount different types of blowpipes on the head. Lines are provided for watercooling the blowpipe when cutting hot steel.

Previous clinics of this type have been held by the Linde company in Birmingham, Ala., and Houston, Tex. A fourth is arranged for New Orleans, Oct. 24.



SEND FOR THIS HANDY CHART!

NICKEL ALLOY STEELS
for Bars, Shafting, Simple Forgings, etc.
This is a general guide and refers only to simple shapes. Steel makers should be consulted regarding irregular sections. The properties recorded are approximate, but representative of those procurable half way between the center and surface. They can be secured in several nickel alloy steels, but only one is given in each case due to space limitations.
Properties given should not be used as minimum specification values, and are not intended to apply to castings.
3240 STEEL
HEAT TREATMENT
1500 O QUENCH, °F.
800/900 TEMPER, °F.
A = air
W = water
O = oil
% ELONGATION in 2"
% REDUCTION of AREA
15
44
177 TENS. STR., 1000 lbs/sq. in.
355 BRINELL HARDNESS
TO OPERATE CHART
Select in the margin, (1) the required size and (2) the desired yield point; or, if these are not shown, the next largest size and next highest yield point. When the arrow points to this size and yield point the recommended steel, treatment and approximate properties will be found in the windows above. Chemical compositions of the steels referred to are listed on the back of this chart.
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street - - - New York, N. Y.
Copyright, 1933 by
The International Nickel Company, Inc.
1 INCH DIAMETER
YIELD POINT LBS./SQ.IN.
75,000
100,000
125,000
150,000
175,000
2 INCH DIAMETER
3 INCH DIAMETER
4 INCH DIAMETER
6 & 8 INCH DIAM.
12 INCH DIAM.

NRA

We Do Our Part

ENGINEERS, and all those concerned with materials of construction, will find this chart convenient. It indicates at a glance the steel compositions and treatments which will develop a broad range of properties in simple shapes up to 12″ in diameter or equivalent sections. Chemical compositions of the steels referred to are listed on the back of the chart. A dependable general guide, saving time and trouble when you want facts quickly. Send for it today. Use the coupon at right.

USE THIS COUPON

The International Nickel Company, Inc.
67 Wall Street New York, N. Y.

Please send me free of charge the Nickel Alloy Steel chart illustrated above.

*Name*_____

*Address*_____

*Company*_____ *Title*_____

S. 10-8-34

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

Miners, refiners and rollers of Nickel. Sole producers of Monel Metal.

Iron and Steel Safety Work Features National Convention

MORE and more, industrial safety — especially machine operation—is being made compulsory.

Engineers, collaborating with safety experts who know how human it is to forget, are designing equipment that simply will not operate unless operated safely.

Such instances were abundantly described and illustrated with projected pictures at the National Safety council's twenty-third annual congress and exposition in Cleveland last week, that attracted more than 8000 delegates and visitors.

For example, J. D. Lyle, Fisher Body Co., Cleveland, speaking before the power press section, threw on the screen a picture of a ponderous autobody stamping press, and explained how the operator must lift his arms out of the way before the press can work. The operator, with his arms extended upward—much as though he were being held up—must touch two air valves to release the ram, and should he take his hands off the valves while the ram is on the down stroke the ram stops.

Safety Instruction Is "Best"

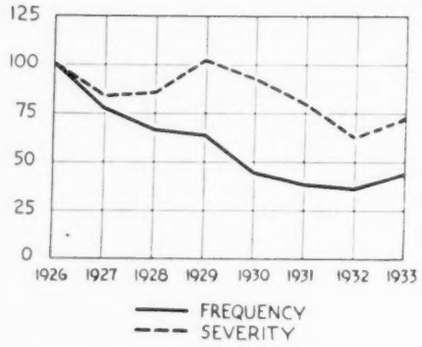
Similar devices for other types of equipment were mentioned during the proceedings, but Mr. Lyle declared that "after all the best safety measure" at the Fisher Body plant is "the regular Tuesday noon meeting, on company time, when all the employes of the plant gather in the shop to hear a talk on safety by some official or foreman." He flashed on the screen a picture of 800 of these workers receiving safety instructions.

How the use of goggles, plus safety education and discipline, has saved 90 eyes at the plants of the American Steel & Wire Co. in the Chicago district was told to the metals section by F. T. Pulse, the company's accident and safety inspector. Mr. Pulse has been engaged in safety work 37 years; the company's Chicago mills have 700 safety rules, 250 kinds of safeguards and devices, and use 102 warning signals.

"During the six years 1910-1915 when use of goggles was largely optional the vision of 42 eyes was completely lost and 12 partly lost in the Chicago district mills," he said. "During six years 1916-1921 when goggles were compulsory for part of the employes 20 eyes were lost and 12 partially destroyed, some of these because of no side shields. For the five years 1922-1926 during which compulsory use of goggles was further extended only eight eyes were lost and there were no partially lost cases.

"During the seven years 1927-1933 the continued use of goggles was made compulsory on all occupations where there was continual danger to eyes, and only eight eyes were lost completely, and the vision of only one eye partially destroyed.

"If we had continued to lose eyes at the 1910-1915 rate up until 1934 there would have been 90 more eyes lost than were actually lost and many more less serious injuries to the eyes. These excess eye injuries would have cost in compensation at the present rate in the neighborhood of $180,000, not including the surgical and hospital expense."



TREND OF ACCIDENTS IN STEEL INDUSTRY: Both the frequency and severity rates for 1926, as determined by the National Safety council, are taken as 100. The leading steel producers are represented. The changes over the 8-year period are determined by comparing the records of identical companies from one year to the next. For all industries, including steel, the frequency rate index dropped from 100 in 1926 to 41.2 in 1933; and the severity rate index was reduced from 100 to 60.6

JOHN E. LONG

Re-elected president, National Safety council. Mr. Long is superintendent of safety, Delaware & Hudson railroad, Albany, N. Y.

Accident fatality in the United States has decreased 31 per cent since the safety movement was organized, Donald B. Gillies, president, Corrigan, McKinney Steel Co., Cleveland, told members at the opening of the general session.

He commented especially on the pioneering work in the safety field which has been done in the steel industry.

"The United States Steel Corp.," he said, "has achieved a noteworthy success in prevention of accidents. This great organization has, during the past 27 years, reduced its serious and fatal accident rate some 57 per cent. That means about 72,000 men were saved, to say nothing of their respective families."

Mr. Gillies also said that in his own company accident prevention had resulted in a great saving of life and limb and of hundreds of thousands of dollars in wages. His own company, which won first prize in the iron and steel national safety contest for 1933-1934, as shown in the accompanying table, has held a leading position for several years.

How Moses Handled "Accidents"

The man who operates a plant and refuses to safeguard dangerous machinery is guilty of causing the death in case of a fatal accident, G. A. Kuechenmeister, Dominion Forge & Stamping Co., Walkerville, Ont., told delegates.

"This is not a new interpretation of the law," he said. "Way back in the days of Moses the law was given that if a man built a flat roof house and failed to put a guard rail around it and a man fell from there his blood was on the house owner's hands.

"It is safe to assume that if there had been modern machinery in use in those days, Moses would have included in his law the safeguarding of that. Perhaps if we had the penalty attached to our present day compensation laws that they had in ancient days we would have fewer industrial accidents."

Safety rules must be regarded in the same manner as operating rules and practices to improve a plant's safety record more quickly, according to G. I. Tranter, general superin-

tendent, American Rolling Mill Co., Middletown, O. He gave this illustration:

"Safety gates had been installed in the rear of the open-hearth furnaces for the protection of men working on tap holes and runners. The safety appliance was not accepted whole-heartedly by the furnace men until a helper fell off the backstanding and was fatally injured. Needless to say, after the accident occurred, the gates were always in place. If the first violation of this safety rule had been handled by the same type of firmness and discipline applied to operating carelessness and disregard, the safety appliance would have been effective and a life saved."

"Five cardinal points must be considered for safe maintenance work on industrial electrical equipment," said J. D. Donovan, superintendent of maintenance, Central Alloy division, Republic Steel Corp., Massillon, O.

"Effective accident prevention work when handling industrial electrical equipment depends on good and approved equipment; proper installation; correct safeguarding; good repair tools and equipment; high type of men; and proper safety education.

Lock Electrical Apparatus

"It is the general opinion of safety engineers today that all electrical apparatus be enclosed so that only authorized persons can possibly come into contact with current-carrying parts.

"Too much stress cannot be laid upon the conscientious use of safety locks. Hasps for safety padlocks are now standard equipment on low voltage enclosed safety switches. The steadfast rule should be made that no mechanical or electrical repairs, regardless of how trivial, can be made unless each craft working on the job has placed a safety lock, locking the power feeder open on the switch."

Lack of adequate training among young men who enter the welding trade was deplored by John H. Baker, supervisor of welding, Youngstown Sheet & Tube Co., Youngstown, O., in a session on fusion welding and cutting.

"We have always had better results with operators we have trained in our own plant than with young men just out of school," he said.

"There are some small town welding schools throughout the United States that take young men in and give them 72 hours' training and send them out with a large diploma, and a long letter saying they are first-class welders. These young men know very little about general welding, and I think these schools should be stopped.

"I think a first-class welder is one that can take a blueprint and lay out his own job and put it together, and know what the job means to others in the future. To save the mechanics of today, why not insist on a man having mechanical ability before becoming a welder?"

Some of the hazards in using portable conveyors were brought to the attention of delegates when R. D. Prushing, manager, portable conveyor division, Jeffrey Mfg. Co., Columbus, O., spoke on "Mechanical Methods of Handling Materials."

"In the early days, it was thought necessary that portable conveyors should be heavily constructed to withstand abuse, shocks and overloads. Since these conveyors depend upon man-power for their portability, it was discovered that the labor involved in handling them was almost as great as in moving the material by hand. Then came a period when all manufacturers attempted to reduce weight to a minimum. The resulting machine proved as unsafe and as unsatisfactory as the heavy type. Profiting from these experiences, we have now reached the point where we may say that portable conveyors are approximately correct in weight.

"Skirt, or side boards, should not be less than 10 inches high to keep material from falling over the sides. This same safety feature applies

(*Please turn to Page* 55)

Prize Winners in Iron and Steel Safety

HERE is the complete list of iron and steel companies awarded prizes for safety in the annual safety contest, July 1, 1933, to June 30, 1934, and announced at the National Safety council's twenty-third annual convention in Cleveland last week. All units shown as No. 1 received plaques, while the others were given certificates of merit. The numbers of man-hours worked during the year, and the number of lost-time injuries are set after the name of each company.

Steel Mills Division, Group A

1—Corrigan, McKinney Steel Co., Cleveland; 7,609,952 hours, 19 injuries.

2—Great Lakes Steel Corp., Ecorse, Mich.; 5,198,662 hours, 22 injuries.

3—Youngstown Sheet & Tube Co., Campbell works, Youngstown, O.; 14,374,036 hours, 62 injuries.

Steel Mills Division, Groups B and C

1—Youngstown Sheet & Tube Co., South Chicago, Ill.; 811,790 hours, no injuries.

2—Republic Steel Corp., Niles, O.; 940,794 hours, 2 injuries.

3—Great Lakes Steel Corp., Hanna furnaces, Ecorse, Mich.; 786,616 hours, 2 injuries.

Rolling, Finishing and Fabricating Division, Group A

1—The Chase Companies Inc., Brass & Copper Co., Cleveland; 1,748,920 hours, 4 injuries.

2—Spang, Chalfant & Co. Inc., Ambridge, Pa.; 2,945,956 hours, 26 injuries.

3—Pittsburgh Steel Co., seamless tube division, Allenport, Pa.; 2,450,125 hours, 22 injuries.

Rolling, Finishing and Fabricating Division, Group B

1—Chapman Price Steel Co., Indianapolis; 395,920 hours, no injuries.

1—Republic Steel Corp., Grand Crossing, Ill.; 386,581 hours, no injuries.

1—Union Drawn Steel Co., plant No. 1, Beaver Falls, Pa.; 326,410 hours, no injuries.

1—Union Drawn Steel Co., Gary, Ind.; 293,758 hours, no injuries.

1—Steel & Tubes Inc., Brooklyn, N. Y.; 270,873 hours, no injuries.

1—McClintic-Marshall Corp., Buffalo; 236,410 hours, no injuries.

1—Lehigh Structural Steel Co., Allentown, Pa.; 217,413 hours, no injuries.

1—Republic Steel Corp., Unionville, Conn.; 128,315 hours, no injuries.

Iron Foundries Division

1—Lycoming Mfg. Co., plants Nos. 2 and 3, Williamsport, Pa.; 696,058 hours, no injuries.

1—Maryland Car Wheel Co., Baltimore; 96,601 hours, no injuries.

3—Ideal Foundry & Machine Co., Beaver Falls, Pa.; 169,070 hours, 1 injury.

Steel Foundries Division

1—Haynes Stellite Co., Kokomo, Ind.; 381,015 hours, 2 injuries.

Heavy Machine Shops Division, Group A

1—United Shoe Machinery Corp., Beverly, Mass.; 6,447,168 hours, 2 injuries.

2—General Electric Co., Philadelphia; 1,909,572 hours, 2 injuries.

3—Gilbert & Barker Mfg. Co., Springfield, Mass., 1,536,296 hours, 4 injuries.

Heavy Machine Shops Division, Group B

1—Lycoming Mfg. Co., plant No. 1, Williamsport, Pa.; 1,098,304 hours, no injuries.

1—C. Hager & Sons Hinge Mfg. Co., St. Louis; 653,271 hours, no injuries.

1—Noera Mfg. Co., Waterbury, Conn.; 196,843 hours, no injuries.

1—D & B Pump Supply Co., Los Angeles; 157,741 hours, no injuries.

1—Pittsburgh Steel Co., National Fabric division, Monessen, Pa.; 156,557 hours, no injuries.

IT BUILT—IN 1877—THE FIRST BLOOMING MILL IN THE UNITED STATES

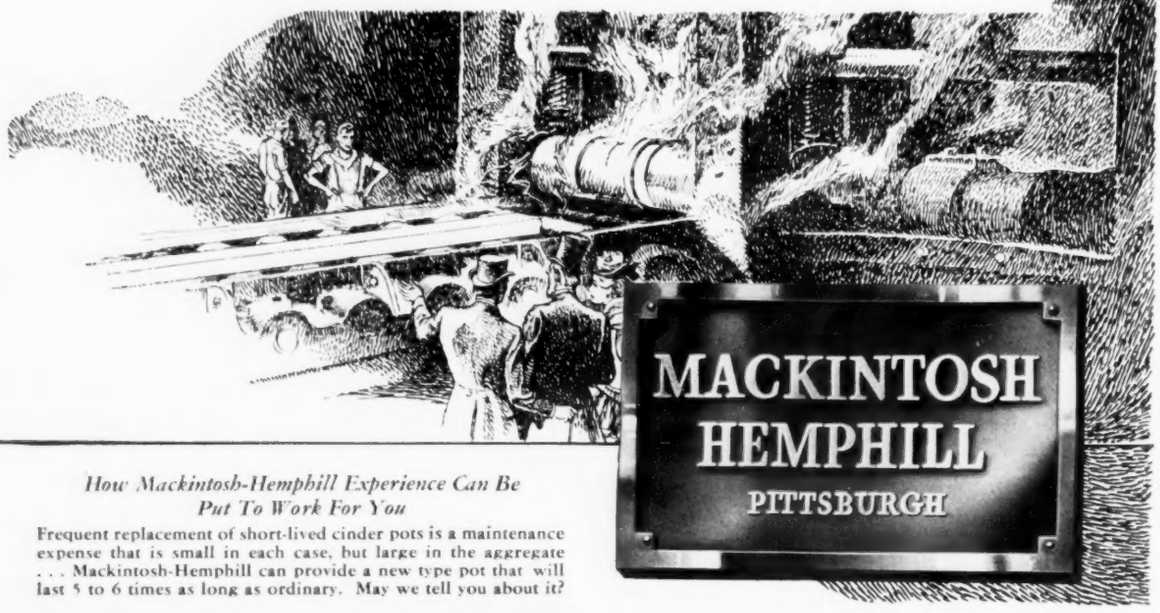
STEEL processing starts, almost without exception, from the bloom. The blooming mill is the veritable foundation upon which the mammoth steel industry is built.

This fact gives added significance to that day in 1877 when the first blooming mill built by Mackintosh-Hemphill for Schoenberger & Co., a progenitor of the American Steel and Wire Company, was put into service.

It gives added significance to that day in 1880 when there was installed in the Pittsburgh-Bessemer Steel Works a Mackintosh-Hemphill three-high bloomer, combining for the first time the requisite massiveness and strength to permit sustained high production—and thus ushered in a new era.

The finest products of that early day would cut but a sorry figure against present Mackintosh-Hemphill standards, but they prove an inherent ability to pioneer, to illuminate the pathway to the future with the light of more than a century's experience.

In the development, design and manufacture of machinery for all departments of steel and non-ferrous processing and finishing, Mackintosh-Hemphill *experience* is at your call. What is *your* problem?



How Mackintosh-Hemphill Experience Can Be Put To Work For You

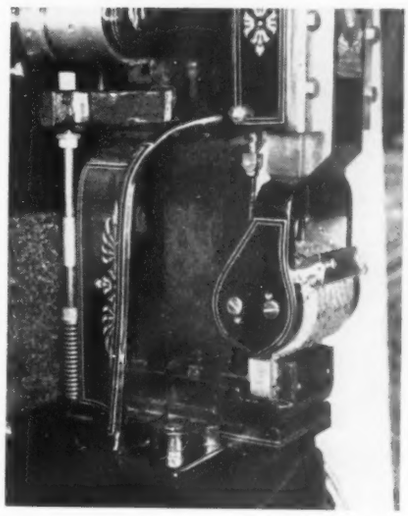
Frequent replacement of short-lived cinder pots is a maintenance expense that is small in each case, but large in the aggregate . . . Mackintosh-Hemphill can provide a new type pot that will last 5 to 6 times as long as ordinary. May we tell you about it?

LARGE USES OF STEEL IN SMALL WAYS

271st Article ◆ Perforating Machines

PERFORATING machines find application in a number of industries in providing an effective means of permanently stamping, dating or identifying in some manner checks, bills, labels, wrappers and the like. Used principally by banks to cancel paid checks, perforators also are employed widely in the food, beverage and other industries.

An important source of business in these machines recently has resulted from prohibition repeal. Beer bottle labels uusally are perforated rather than stamped to indicate the date of bottling, the perforator used for this operation being adjustable in order to give the desired date. Some manufacturers of spirits also have adopted these machines to mark the stamp tax affixed to each bottle. These stamps come in sheets which, by means of a special machine, can be perforated with the bottler's licensed number and cut into strips in one operation.



Courtesy American Perforator Co., Chicago

Heavy-duty type of perforating machine for consecutive numbering work

Are Miniature Punch Presses

Perforators in effect are miniature punch presses except that a multitude of small punches make up each machine, the number depending on how many holes are required to spell out the number or word intended to be pressed through the paper. These usually range from 75 to 350. The machines vary in size from the small, hand-operated type weighing less than 20 pounds to large, motor-driven units weighting more than 1750 pounds. Illustrated is a heavy-duty type of perforator designed for consecutive number work. Check conceling machines employed by banks usually are motor driven and may be adjusted to indicate the particular date on which the check was paid.

While involving the use of relatively small lots of iron and steel, manufacture of perforators requires a variety of types of such materials, including music wire, mechanical tubing, strip, tool steel and shafting as well as cast iron and steel. It is estimated conservatively that more than 50 tons of iron and steel is consumed annually in this industry, the larger portion of this being in the form of castings. Frames usually are made of cast iron, while steel is used for the principal parts of the perforating mechanism. In one instance where corrosion was a problem due to the fact that the machine was intended to perforate hides, monel metal was substituted for steel wherever possible.

Individual punches are made of music wire generally ranging from 0.036 to 0.067-inch in diameter. The practice of one manufacturer is to take the wire in straight lengths of 3 feet and cut it to size. It is then swaged on a specially designed machine. This operation provides a small collar which is required in order to lift the punch after it has been pressed through the paper or other material that is being stamped.

Rings Located on Arbor

In adjustable date perforating machines, such as check cancelers, rings cut from mechanical tubing are located on an arbor made of ground and polished shafting. These rings are drilled with small holes in the design of the desired character and of a size to match the individual punch. In the perforating operation the rings perform a function similar to that of a player piano roll—either the punch slips into a hole in the ring or is pressed downward to perforate the paper as the arbor and rings descend, depending on what date number is selected. The rings may be turned on the arbor to pick out the desired date. Forgings are used for the rings on the largest machines.

Care is required in drilling the rings as well as the die in which the punches operate due to the small size of the holes and the close adjustment necessary. Dies generally are made of tool steel. Other necessary parts include a stripper, lifter and top or guard plate, the former serving to return the punches to position after they have been forced through the paper. The stripper may be made of low-silicon iron or semisteel.

Safety Convention Develops Ideas for Steel Industry

(*Concluded from Page* 53)

equally to belt conveyors. No portable conveyor handling bulk materials should be without skirt boards."

A. J. Morgan, chief engineer, wire rope division, John A. Roebling's Sons Co., Trenton, N. J. explained the "Care and Use of Wire Rope Slings" to the section on mechanical methods of handling materials.

"The total number of wires in a wire rope sling, whether made of grommet construction or from a rope, is seldom less than 114, and very frequently, in fact in all sizes 1⅛-inch and larger the number reaches 259 to 271, or possibly a few more wires," he said.

"It will be readily apparent that the breaking or cutting of a few wires in a sling of this type will not seriously impair its strength and yet ample warning will be given by such wire breaks that the sling is deteriorating and should be watched more carefully, or that the rope or grommet should be replaced. This is a very definite safety feature of wire rope."

Hard to Teach "Old Hands"

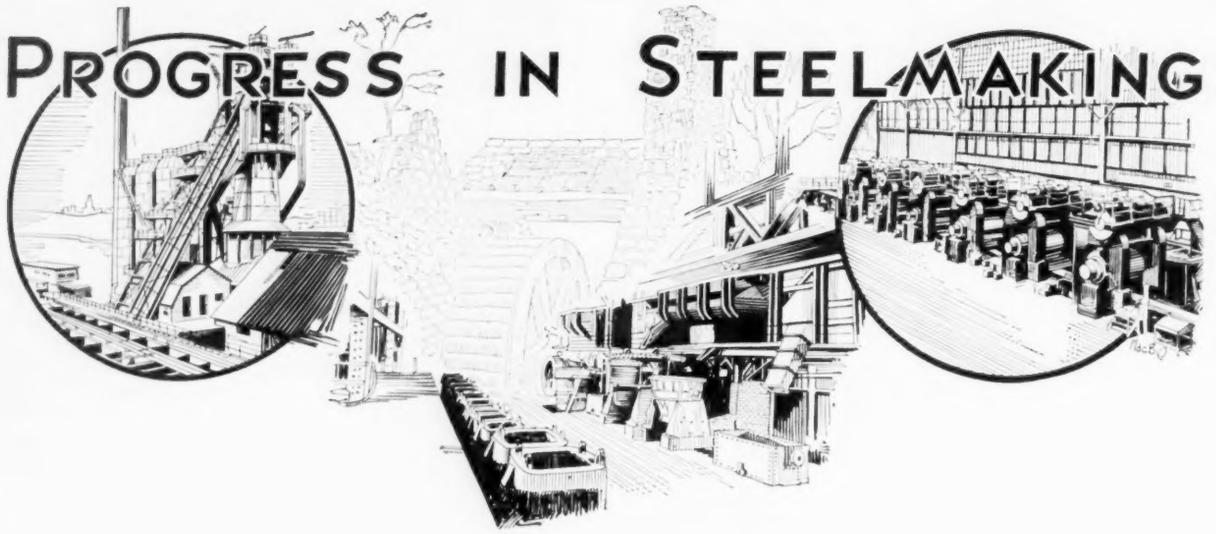
Developing safety consciousness and co-operation in the supervisory force has become "the real problem in safety work today," H. W. Darr, safety supervisor, Cambria plant, Bethlehem Steel Co., Johnstown, Pa., told members of the automotive and machine shop section.

"After 20 years of dealing with all types of men in accident prevention," he said, "we have come to the conclusion that the only effective method is the old adage 'Learn to do by doing.' The formulation of sound habits, requires repeated thought. We constantly see the old supervisor, who is established in his ways, consistently refusing to change his line of thought or his way of doing things."

J. A. Voss, director, industrial relations, Republic Steel Corp., Youngstown, O., was chosen as general chairman of the metals section for the coming year. This section is the largest and oldest of 28 sections in the National Safety council. Theodore Meissner, American Can Co., Chicago, was selected as chairman of the power press section.

Sectional meetings were in progress daily in three hotels, and exhibits of safety appliances and equipment were held in two hotels.

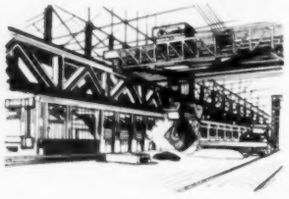
PROGRESS IN STEELMAKING



RESEARCH has culminated in the perfection of a new electrolytic process for pickling high-speed steel. An alkaline bath composed of 115 grams of sodium hydroxide and 15 grams of citric acid per liter is used with a current density of 25 amperes per square foot. Uniform evolution of gas indicates pickling is completed; the work then is rinsed and dipped for an instant into a hydrofluoric acid solution.

• • •

Resistance to heat and corrosion is claimed for a molded metallic material which is unaffected by weak solutions of many acids and alkalies. The material, which is suitable for making die-casting dies and synthetic plastic molds, is nonoxidizing, has no grain growth up to 1800 degrees Fahr., has a fine grain structure and is dense, hard and tough. Ductility and strength of the material increases up to red heat. It can be machined to accurate dimensions and can be welded but it cannot be torch cut because of its high resistance to oxidation. The product has a tensile strength ranging from 45,000 to 50,000 pounds per square inch and a brinell hardness of 250 to 270.



Insulating the roof of a 75-ton natural gas-fired open-hearth furnace with 2 inches of mineral wool cement afforded a reduction of 5 per cent in the fuel consumption and a saving of $1500. The total cost of labor and material for insulating the roof was $75.

• • •

Experiments being conducted at two open-hearth shops in Ohio with ingot molds containing about 0.20 per cent molybdenum disclose little cutting. When high amounts of this element are used in the mold iron (up to 0.50 per cent) early failure due to cracking results.

• • •

Piercing chrome-vanadium and nickel-molybdenum steel as well as carbon steels is being accomplished successfully with tube mill plugs made of a recently developed alloy steel. Piercing shoes made of the new material seldom pick up scale, thus affording pipe free of guide marks. Up to 15 shutdowns frequently are required for changing piercing shoes but guides made of the new type alloy steel remain in service for indefinite periods, according to field data, thus affording increased production at a lower cost.

• • •

Means for flattening the buckle and bulges in thin-gage sheets, which arise as a result of slight inaccuracies of the rolls and screw-down setting, are embodied in a new type leveling machine. The unit is of the close center staggered roller type equipped with 17 rolls. These are driven through sleeve-type universal couplings from an enclosed drive mounted in roller bearings. Backing rolls of the same diameter but about half the length of the working rolls are adjustable vertically to maintain contact with the straightening rolls. The vertical opening between the rolls is indicated by four graduated drum-type gages. Leveling rolls can be removed readily for dressing and can be replaced and adjusted quickly.

• • •

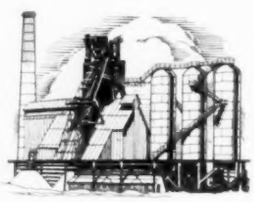
Steel subjected to a new rust-resisting treatment may be stored without danger of rusting until the finishing coat is to be applied. The metal parts to be treated are immersed in a solution from one to five minutes and then are rinsed in hot water after which they are dried in the open air or a warm air blast. The solution is composed of a powder and a solvent used in water at a temperature of 150 degrees Fahr. Approximately 10 ounces of the powder and 3 ounces of the solvent are used per gallon of water.

• • •

Discovery of microscopic cracks in slightly affected boiler steel plate has been made possible by the development of a magniscope—a magnifying periscope with a camera attachment which photographs the walls of rivet holes in caustic embrittlement investigations.

• • •

Reduction studies made by the bureau of mines indicate that physical



properties of sinter are more important than chemical properties in controlling rates of reduction of such sizes as are used in the blast furnace.

WASHBURN flat wire

high or low carbon • tempered or untempered • many widths, thicknesses and finishes

We are a medium size organization that has not grown too large to prevent us from keeping in personal touch with our mill schedules and operations, and our customer's requirements.

Extreme care is used in keeping the various heats separate. Each end of every coil of flat wire is examined for pipes and seams and the coils as a whole are inspected for superficial defects. A percentage of each lot is also examined microscopically.

Attention to detail results in flat wire uniform in temper, thickness, straightness throughout the coil.

Flat wire is available in cold rolled high or low carbon steel in widths from $\frac{1}{16}$" to 4" and thicknesses from .004 to .125 in various finishes including tinned, galvanized and bronzed.

Our close, personal attention to orders places our service on a par with our high standards of quality. May we submit samples to your specifications?

WASHBURN WIRE CO., PHILLIPSDALE, R. I. **WASHBURN WIRE CO., Inc.,** NEW YORK CITY

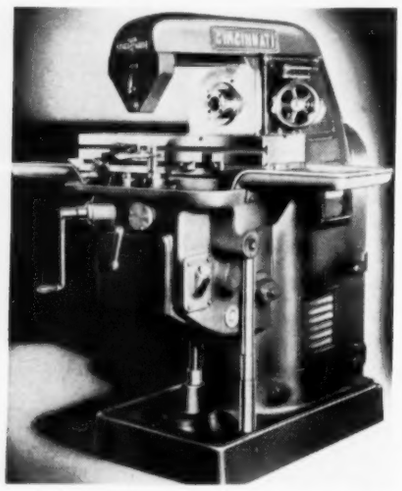
WASHBURN

CLEAN, UNIFORM BILLETS—STRIP—RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Automatic Milling Machine—Cincinnati Milling Machine Co., Cincinnati, now is offering a new automatic milling machine, shown herewith, for low cost milling of large or medium lots, small size parts. It should prove especially profitable to those who manufacture small tools, small automotive parts, typewriters, cash registers, tabulating and business



Cincinnati automatic milling machine for milling small parts

machines, gages, meters, small arms, hand tools, sewing machine and telephone parts, and other jobs of a similar size or character.

Eight spindle speeds are available up to 1800 revolutions per minute, by means of pick-off gears located in the column. Three series of speeds are available; low from 49 to 361 revolutions per minute furnished as standard equipment unless otherwise specified, and the high series 246 to 1800 revolutions per minute at extra cost. Spindle reverse is provided.

Sixteen table feeds up to 80 inches per minute are available with pick-off gears. Standard series ranges from 2 to 80 inches, and special series supplied at extra cost from 1 to 40 inches. The pick-off gears are conveniently located under the cover that is held in place by one cam lever at left side of knee. The table has a complete automatic working cycle which includes a sensitive control lever for engagement, 400 inches per minute power rapid traverse, and dog-controlled intermittent feed and rapid traverse in any combination or direction depending upon the type and number of table dogs employed. The entire arrangement provides for extreme accuracy of trip.

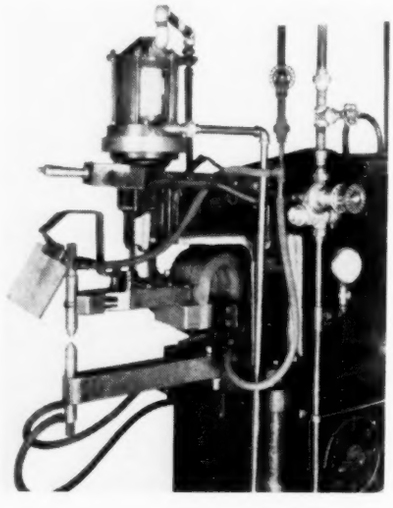
Position of the control lever determines the direction of the table travel and also whether the table is moving at the feed or rapid traverse rate. A single lever to the right of the vertical adjusting crank starts and stops the table movement without effecting the operating cycle. Power longitudinal travel is 12 inches with rack feed. Hand adjustment of the table may be secured by means of a crank which can be engaged on the right side of the knee.

The machine itself is patterned after the Cincinnati knee-type millers in that it has a pyramid-shaped column with self-aligning rectangular dovetail overarm and light weight arbor supports. The overarm may be moved into the desired position after loosening the nuts on the overarm clamping bolts located on the left-hand side of the column. The overarm can be securely locked into position by re-tightening these same nuts.

The spindle has a national standard No. 40 taper with $3\frac{1}{2}$-inch taper per foot, $1\frac{3}{4}$-inch diameter front end, and 1-inch diameter at the rear end of the taper hole. The large diameter quill which carries the spindle can be moved at right angles to the table movement by loosening the quill clamping lever and turning the adjusting hand wheel, both located on the upper right-hand side of the column.

♦ ♦ ♦

Arc Welder Control—Hanna Engineering Works, Chicago, is introducing an inexpensive modernization of manually operated arc welders. An air or hydraulic cylinder is mounted on the flange of the barrel surrounding the ram and closing the electrodes. A pressure regulating valve enables the operator to obtain the pressure desired on the electrodes. The cylinder is controlled by a foot operated valve.

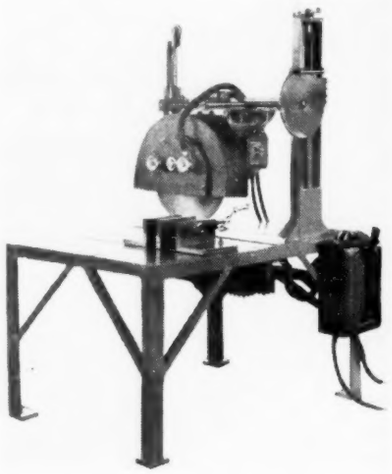


Arc welder control manufactured by Hanna Engineering Works

In addition to relieving the operator of the manual exertion of closing the electrodes, this arrangement insures correct and uniform pressure for each weld. Thus an operator secures more welds per day and with the same pressure applied to each. The air cylinder is available in diameter sizes of 3 inches and larger and is furnished to fit the flange of the ram barrel. This eliminates the necesity of any machine work on the welder.

♦ ♦ ♦

Electric Arc Saw—Rich Mfg. Co. Ltd., 3851 Santa Fe avenue, Los Angeles, is manufacturing a unit known as the Strobel electric arc saw. In operation, an electric arc formed between the teeth of a rapidly rotated saw blade and material to be cut, heats the metal directly in the saw's path to a plastic or molten state so that the pressure created by the saw blade can clear the metal from the scarf. Due to the fact that the blade rotates in a magnetic field and because of other principles in construction, the electric arc is concentrated on the material directly in front of the teeth. Since the speed of travel through the material to be cut is high, the arc is concentrated at any given point for only a short period of time.



Strobel electric arc saw cuts steel, iron or alloy metals

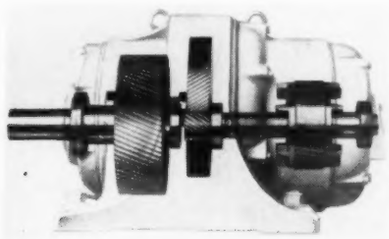
Chief advantage in utilizing this method of cutting steel, iron or alloy metals, aside from economy, consists

in the fact that neither hardness of material nor analysis may be taken into consideration, it is claimed. The manufacturer declares that it is an ideal process to use in cutting spring steels, tool steels, and even the hardest carbides or overlaid steels. The saw also may be used in machining operations.

Several standard types of mountings or machines are built. Model 5 SA, shown on p. 58, is an all purpose or bench type saw. To generate the arc between the saw and the work, either a direct-current welding generator or an alternating-current welding transformer may be employed.

♦ ♦ ♦

Geared Electric Motor—U. S. Electrical Mfg. Co., 206 East Slauson avenue, Los Angeles, is building a "Synerogear" motor. The unit, shown herewith, is self-contained motor with a single base, embodying a geared transmission foundationed



"Synerogear" motor designed by U. S. Electrical Mfg. Co.

on a heavy gear pedestal base, which supports the unusual torque strains in high torque geared reductions. A pyramidal base gives the unit mechanical strength and a streamline design. Full rated horsepower is delivered to the take-off shaft. A fully enclosed gear compartment excludes foreign matter. The highest speed gears are not completely submerged in oil, thus preventing foaming and resistance.

♦ ♦ ♦

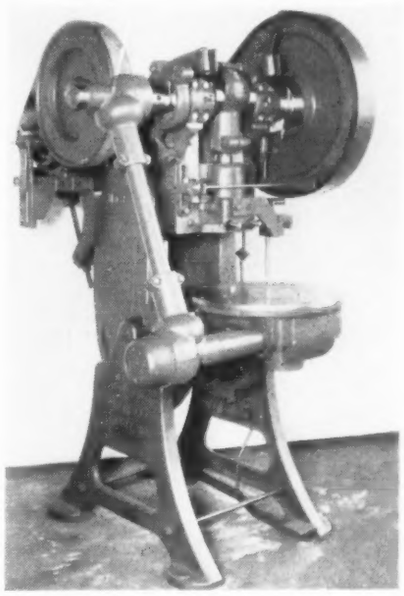
Separator for Storage Batteries—Electric Storage Battery Co., Nineteenth and Allegheny avenue, Philadelphia, recently announced that Exide-Ironclad batteries now are equipped with separators of Exide Mipor, an entirely new material. It is a form of vulcanized rubber in sheets, which is permeated with countless microscopic passages permitting free diffusion of the electrolyte. So small are these passages that the most minute solid particles of active material are prevented from passing through, it is claimed.

These separators are not affected by the electrolytic solution in a battery. Because they are vulcanized with heat during manufacture, they are immune to heat developed in a battery. They have the necessary mechanical strength to withstand vibration and the rough conditions of service to which a battery is frequently subjected. The new separators are used exclusively in Exide-Ironclad batteries for electric industrial trucks and switching locomotives, mining locomotives and trammers, etc.

♦ ♦ ♦

Die Feed for Press—Federal Press Co., Elkhart, Ind., now has on the market a dial feed that has many features of safety as well as performance. As shown herewith, every moving part is housed completely, thus affording complete safety to the operator. The dial also has been designed so that tooling jobs can be interchanged with the ease of changing ordinary die sets.

One of the reasons for the ease and speed in changing jobs is the fact that the dial plate is independent of the indexing mechanism and the dial plate is easily removed and any



Federal dial feed for presses embodies safety feature

number of dial plates can be used and they are low cost. Unusual speed can be obtained with the dial feed due to the smoothness and positive indexing, it is claimed. The indexing mechanism is completely protected from dirt and chips from the pieces being run.

The dial is skid proof and yet does not employ any brakes, locking pawls or such devices for stopping the dial correctly, the manufacturer declares. It is also possible to index the dial in one fourth of the revolution of the crankshaft, allowing longer rest or loading periods between indexing. The arrangement can be used on any make of press.

♦ ♦ ♦

Liquid Carburizer—E. F. Houghton & Co., 240 West Somerset street, Philadelphia, recently announced a new carburizer for small work. Advantages claimed for the "Perliton" liquid carburizer include: Uniformity in depth of case and carbon content, low cost per ton of steel, longer pot life, no decarburization, non-hygroscopic, high thermoconductivity, lower consumption than other salt mediums, no variation in degree of fluidity, reduced heating time, no rust after water quenching.

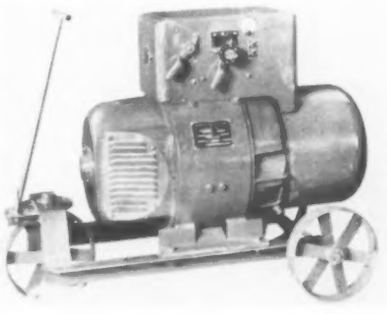
It is pointed out by the manufacturer that the process is true carburization; the same type of carburized case is obtained as produced by any of the solid carburizers requiring pack hardening. "Perliton" is especially adapted for carburizing work requiring a depth of case from skin hardness to 0.04 inch.

♦ ♦ ♦

Arc Welding Set—General Electric Co., Schenectady, N. Y., recently brought out a line of improved, portable, single-operator arc welding sets, one of which is shown herewith. Self-stabilization is the outstanding feature.

Each welder is a self-contained unit, having no external reactor, resistor, or separate exciter. It is due largely to the self-excited design of these machines that the inclusion of sufficient self-stabilization to provide steady welding characteristics under all conditions is possible.

Separate controls are provided for adjustment of welding current and welding voltage. These controls are located on a dead-front panel on top of the machine and at the most convenient height above the floor. On this panel also are located a switch handle for reversing polarity and an instrument with selector switch for indicating welding current and welding voltage.



Improved arc welding set introduced by General Electric Co.

Metallurgists and Designers Aid Die Casting Progress

(*Concluded from Page* 46)

discussion of brass die castings covered studies of phase changes during aging of zinc alloy die castings. Authors were M. L. Fuller and R. L. Wilcox, research division, New Jersey Zinc Co. Opening the address, Mr. Fuller, who presented the data, brought out that owing to the nature of the die casting process, freshly cast alloys are undoubtedly not at equilibrium from the standpoint of alloy phase relationships. After casting, therefore, they tend to undergo phase changes, with the ultimate effect of reaching a state of equilibrium at the aging temperature, beyond which no further change takes place. This phase alteration undoubtedly is one of the primary causes of the changes in dimensions and physical properties that zinc alloy die castings undergo during aging. He explained that it is planned to report on this problem in a series of papers of which this is the first.

Observe Phase Changes

The two authors made a study of commercial zinc die casting alloys over a period of several years, utilizing the X-ray diffraction technic of determining the phase composition changes in the alloys. Up to the present, two principal phase changes have been observed which are capable of causing dimensional changes: (1) The segregation of secondary constituents from the zinc base solid solution and (2) the beta aluminum zinc decomposition. The latter is the subject that was discussed and studies on the former will be reported on extensively at a future date.

In summarizing their investigation, Mr. Fuller declared it has been found that the beta phase decomposes in less than one week of aging in die castings. This rapid decomposition takes place in spite of the copper and/or magnesium present in zinc alloy die castings, whereas single phase beta alloys containing magnesium require over six weeks for the complete decomposition to take place at room temperature. It is shown that the beta decomposition cannot be the sole cause of the aging shrinkage in die castings. Other phase changes that contribute to the shrinkage phenomenon will be reported on in later papers.

Concluding the morning die casting symposium of the Institute of Metals, Thomas A. Wright, Lucius Pitkin Inc., explained the role of the spectrograph in the control of die casting production. Examples were given of the necessity for purity and specification control. The point was made by Mr. Wright that the use of secondary metals, while in every way economically desirable, should be controlled by inspection and analysis and that, as this may be qualitative or semi-quantitative in nature in many cases, the spectrograph offers great savings in time, speed and labor.

Highlights of Metal Exposition

(*Concluded from Page* 50)

Co., New York. The instrument has two standard calibrated scales and in addition a red scale up to 3700 degrees Fahr., determining the true spout and pouring temperature of iron and steel when measured in the open. The unit is made for self-recalibration by the operator by means of a master lamp in addition to two service lamps. This optical pyrometer is self-contained, allowing direct reading without charts.

Brown Instrument Co., Philadelphia, displayed pyrometers, flowmeters and thermometers for the automatic control of hardening, tempering, annealing and drawing temperatures. A cutaway model of a new control thermometer demonstrated how temperatures up to 1200 degrees Fahr. can be controlled without the use of relays. This thermometer-controller operates in mercury-in-glass switches which have a capacity of 15 amperes at 110 volts, 10 amperes at 220 volts. The unit separates control functions from measuring functions.

VARIOUS steps in the cadalyte plating process were illustrated by the Grasselli Chemical Co. Inc., Cleveland. Operating exhibits of practical pickling, with strip samples of various types of pickled sheets, inhibitor carboys and drums and titration tests of pickling solution were featured. Cadmium anodes, cadalyte solution and plated parts with a plating room display of motor generator sets, control panel and tumbling barrel were included, also a large showing of acids and fluxes.

N. Ransohoff Inc., Cincinnati, had in operation a return tumbling barrel, combining pickling and tumbling in the removal of scale from small forgings. A side-loading barrel, demonstrating the return principle and the removal of scale by wet sand and tumbling, with samples of the work processed, was displayed. The end loading tumbling unit is rubber lined.

Carburizing of light and small parts with perliton liquid was graphically done at the working exhibit of E. F. Houghton & Co., Philadelphia. A liquid heat and a carbon chemical compound are the component parts of this carburizer. The liquid heat is nonhygroscopic chemical compound in powdered form, melting at 1100 degrees Fahr. The carbon compound contains especially prepared amorphous carbon, black in color in lump form of nonuniform mesh, but not in large lumps. The carburizer requires the use of a furnace suitable for liquid baths.

Tumbling and burnishing machinery for ferrous and nonferrous parts and materials, including a tilting barrel with individual motor drive were operated by the Globe Machine & Stamping Co., Cleveland.

J. B. Ford Co., Wyandotte, Mich., featured specialized metal cleaners for plating, lacquering, enameling, japanning and vitreous enameling. Burnishing compounds, cleaners for use in still solutions, neutralizers for after-pickling operations and an extensive list of other cleaning materials were shown.

Removal of carbon smut and insoluble dirt, frequently found on cold-rolled steel products, by the use of its special process was stressed in the display of Oakite Products Inc., New York. Other substances found in drawing compounds and abrasives used in polishing and buffing materials are readily removed by this process, it is claimed, without tumbling or other mechanical methods of cleaning.

(This by no means covers the complete list of products seen at the exposition. Description of other materials and equipment will appear in next week's issue.)

Trade Publications

CHAIN DRIVES—Renold & Coventry Chain Co. Ltd., Manchester, Eng., has issued a catalog of its stock chain drives and also one of its various products for industrial applications.

ELECTRIC INSTRUMENTS—Catalog GEA-602D by the General Electric Co., Schenectady, N. Y., is a comprehensive publication covering a wide line of appliances for use in industry, with illustrations and descriptions.

BENTONITE—Silica Products Co., 700 Baltimore avenue, Kansas City, Mo., has published a revised edition of its bulletin No. 107 on bentonite. Information is presented on properties, sources, geology, production and uses. Specifications for bentonite also are presented.

CHAINS AND SPROCKETS—Palmer-Bee Co., Detroit, has issued section 101 of its general catalog No. 100, covering steel and drop-forged chain and sprocket and traction wheels for use in elevating and conveying installations and for positive drives and power transmission purposes. This is the first of nine sections which will be published, covering the company's entire line.

Slow Buying Reflects More Price Uncertainty

Steel Rate Holds at 25—Sharp Drop in Automobile Output Prelude to Model Changes—September Pig Iron Output Off 12 Per Cent; Ingots Fractionally

IMPROVED sentiment in iron and steel markets, based on expectation of long-deferred requirements, has not yet been translated into any large-scale buying, though the slight gain in the number and size of orders last week was sufficient to sustain steelworks operations at 25 per cent.

Fundamentally, delay in general manufacturing specifications has been due to slowness in most markets for consumer goods, but it is becoming more apparent that large users are making every effort to forestall purchasing, apparently in anticipation of lower prices.

Some of the railroads have postponed car repair programs, avowedly for this purpose. Instead of buying new material, a large oil company is dismantling tanks in one district, moving them to another where more urgently needed.

Scrap prices are again wavering, strength at Chicago being more than offset by reductions at Detroit and Pittsburgh. Pig iron producers are finding it more difficult to compete against scrap, though pig iron is only twice the price householders are paying for good grades of soft coal. Because some consumers installed equipment to slit wide sheets to make narrow strips, cold-rolled strip manufacturers have announced reductions as much as $25 a ton.

New Code Policies an Unsettling Factor; Another Public Works Program Shaping Up

Adding to the uncertainty regarding prices, last week was the outspoken attitude of Donald R. Richberg, indicating that as the administration's chief policy-making official he will put into practice his idea that NRA codes should be purged of all price and production control features. Carried out, for steel this could only mean a general revision of the present, government-sponsored set-up of code prices.

As an encouragement, however, the government is bringing out a new two billion dollar public works program, supplementing that now being concluded, and expected to develop large steel tonnages.

Structural awards last week, 19,984 tons, were nearly double those of the week preceding, and included several fair size industrial structures, the DuPonts placing 2800 tons for an Edgemoor, Del., plant. Republic Steel Corp. is making tentative inquiries for a strip-mill building which may require 2000 tons. Standard Oil of California has awarded 4400 tons of plates for 11 tanks.

Automobile Plants Shut Down; Furnaces Kept in Blast but Tonnage Did Not Develop

Automobile output last week dropped sharply to 19,000, when Buick, Cadillac, Pontiac, and all Chrysler units except Dodge shut down. Some automobile manufacturers promise steelmakers specifications for new models by Nov. 1.

Prospects for additional rail buying this year seem more remote as figures are brought to light showing that a large proportion of the 800,000 tons purchased with government money have not been laid. Only seven freight cars were awarded in September, the smallest number this year, compared with 105 in August.

Sixty-one blast furnaces remained in operation in September, unchanged from the preceding month, though a slower rate of operations is manifest in average daily output at 29,969 gross tons, 12.3 per cent less than in August. Output for the month—899,075 tons—was the lowest since May, 1933. For nine months, 13,040,414 tons represents a gain of 36 per cent over the first nine last year.

September steel ingot production made a relatively better showing than did pig iron, a daily average of 50,065 gross tons being less than 1 per cent below August. For the month, however, due to the holidays, the total, 1,251,630 tons, was down 8 per cent. Nine months' output, 20,268,462 tons, compares with 17,189,390 tons in the first nine months last year.

Steelworks operations last week were reduced only in the Detroit district, 18 points there to 59 per cent. Wheeling was up 2 to 33; Pittsburgh 1 to 18; Youngstown 1 to 29. Cleveland held to 28; Buffalo 24; Birmingham 25; Chicago 26; and eastern Pennsylvania 17. Tin plate mill operations are up 5 points to 50 per cent.

STEEL'S iron and steel price composite, down 4 cents to $32.09, reflects easier scrap; the finished steel index holds at $54, while the iron and steel scrap figure is off 9 cents to $9.33.

COMPOSITE MARKET AVERAGES

	Oct. 6	Sept. 29	One Month Ago Sept., 1934	Three Months Ago July, 1934	One Year Ago Oct., 1933	Five Years Ago Oct., 1929
Iron and Steel Composite	$32.09	$32.13	$32.15	$32.32	$30.53	$35.85
Finished Steel Composite	54.00	54.00	54.00	54.05	49.20	56.79
Steelworks Scrap Composite	9.33	9.42	9.45	10.30	10.37	15.44

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average forLast Month, Three Months and One Year Ago

	Oct. 6, 1934	Aug. 1934	June 1934	Sept. 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.80	1.75
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.65
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	28.00	28.00	26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00

	Oct. 6, 1934	Aug. 1934	June 1934	Sept. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.76	19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	17.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern, No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X, Eastern del. Philadelphia	20.63	20.63	20.63	17.76
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.54
Gray forge, del. Pittsburgh	18.88	18.88	18.88	18.38
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	87.24
Scrap				
Heavy melting steel, Pittsburgh	$10.25	10.75	12.00	12.45
Heavy melt. steel, No. 2, east. Pa.	8.00	8.00	8.40	9.20
Heavy melting steel, Chicago	8.75	8.65	9.55	9.35
Rails for rolling, Chicago	9.75	10.35	10.85	11.10
Railroad steel specialties, Chicago	9.75	9.80	10.50	10.50
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	3.25
Connellsville, foundry, ovens	4.60	4.60	4.60	3.85
Chicago, by-product foundry, del.	9.25	9.25	9.25	8.75

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel Institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Long ternes, No. 24 unassorted	3.40c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, cut lengths, c. l.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up, 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve., 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago, up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 .15 to .25 Mo.			0.50
4600 .20 to .30 Mo. 1.75 Ni.			1.05
5100 .80-1.10 Cr.			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon Van.			0.95

9250....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23/4-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham, base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pittsb., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thrd.	70-10-10 off
Rolled thread, ½ x 6 and smaller	70-10-10 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70-10-10 off
Tire bolts	70-10 off
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller	70-10-10 off
Step bolts	70-10 off
Elevator bolts	70-10 off

NUTS

S.A.E. semifinished hexagon: ½ to ⅞-inch	75-10 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10 off
Do., larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron ½	31½	15
¾	36½	20½
1—1¼	39½	25 72
2	41½	26

LAP WELD

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron 2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel	
½, butt weld	57½
⅛-inch, but weld	50½
¼—⅜, buttweld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts., over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
3-in & over, east fdy	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B. Stnd. fitgs., Birm. base $100.00

Semifinished Steel

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Youngs., Chi., Buff., Canton, O., and Sparrows Point, Md.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur	$3.60- 3.85
Connellsville, fdry	4.60
*Connell. prem. fdy.	5.10
New River fdry	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, Del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	19.00c
90 per cent benzol	19.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

†Naphthalene flakes and balls, in bbl.	6.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh dist. from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.25	Lake Superior fur.	21.00
Pitts. dist. fur.	18.25	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic,

56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos...	9.50
Spanish No. Africa basic, 50 to 60%..	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton, c.i.f.....	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%..	26.00
So. African, 52%.....	26.00
So. Afr., 49-51%.....	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala....	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago....	54.00
Birmingham, Ala....	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base..	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20%, dom. fur. spot†..	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload..	85.00
Do., 75 per cent..	126-139.00

Spot, $5 a ton higher.

Silicomang., 2½ carb.	90.00
2% carbon 95.00; 1%	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton..	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high)	14.50
Copper, hot rolled....	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base....	9.50

Tubes and Pipes

High yellow brass..	17.00
Seamless copper	17.25

Rods

High yellow brass..	13.00
Copper, hot rolled..	13.25

Anodes

Copper untrimmed..	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass

*New York	4.25- 4.50
*Chicago	4.00- 4.25
*Cleveland	4.50- 4.75
St. Louis	4.25- 4.50

Heavy Copper and Wire

*New York	5.50- 5.75
*Chicago, No. 1	5.25- 5.50
Cleveland	5.25- 5.50
St. Louis	5.25- 5.50

Composition Brass Borings

*New York	4.00- 4.25

Light Copper

*New York	4.37½-4.62½
*Chicago	3.87½-4.12½
*Cleveland	4.50- 4.75
St. Louis	4.25- 4.50

Light Brass

*Chicago	1.87½-2.12½
*Cleveland	2.50- 2.75

Lead

*New York	2.75- 2.87½
Cleveland	2.60- 2.75
Chicago	2.62½-2.87½
St. Louis	2.75- 2.85

Zinc

*New York	1.75- 2.00
*Cleveland	1.75- 1.90
St. Louis	2.50- 2.60

Aluminum

Borings, Cleveland..	6.00- 7.00
Mixed, cast, Cleve..	10.25-11.00
Mixed, cast, St. L....	9.25-10.25
Clips, soft, Cleve.....	12.00-13.00

Secondary Metals

*Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	14.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL	
Birmingham	8.00- 8.50
Boston, dealers	5.00- 5.25
Buffalo, No. 1	9.50-10.00
Buffalo, No. 2	8.50- 9.00
Chicago, No. 1	8.50- 9.00
Cleveland, No. 1	8.00- 8.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa.	9.50- 9.75
Eastern Pa., No. 2	8.00- 8.50
Federal, Ill.	7.00- 7.50
Granite City, R. R.	7.25- 7.75
Granite City, No. 2	6.25- 6.75
N. Y., deal. R. R.	8.00
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	10.00-10.50
St. Louis	6.50- 7.00
Valleys, No. 1	10.50

COMPRESSED SHEETS	
Buffalo, dealers	8.50- 9.00
Chicago, factory	7.75- 8.25
Cleveland	7.00- 7.50
Detroit	7.50- 8.00
E. Pa., new mat.	9.00- 9.50
Pittsburgh	10.00-10.50
St. Louis	5.00- 5.50
Valleys	10.00

BUNDLED SHEETS		
Buffalo	6.50- 7.00	
Cincinnati, del.	6.00- 6.50	
Cleveland	6.50- 7.00	
Pittsburgh	8.25- 8.75	
St. Louis	4.00- 4.25	

SHEET CLIPPINGS, LOOSE	
Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	4.50- 5.00
St. Louis	3.50- 4.00

STEEL RAILS, SHORT	
Birmingham	10.00-10.50
Buffalo	12.00-12.50
Chicago (3 ft.)	9.50-10.00
Chicago (2 ft.)	10.50-11.00
Cincinnati, del.	9.75-10.25
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	13.00-13.50
St. Louis, 2 ft. & less	10.00-10.50

STEEL RAILS, SCRAP	
Boston	5.00- 5.25
Chicago	8.50- 9.00
Pittsburgh	10.75-11.25

STOVE PLATE		
Birmingham	5.50- 6.00	
Boston, dealers	3.25- 3.75	
Buffalo	8.50- 9.00	
Chicago, net	5.50- 6.00	
Cincinnati, dealers	5.00- 5.50	
Detroit, net	6.00- 6.50	
Eastern Pa.		8.50
N. Y., deal. fdry.		6.00
St. Louis	5.00- 5.50	

COUPLERS, SPRINGS	
Buffalo	12.00-12.50
Chicago, springs	9.50-10.00
Eastern Pa.	12.50-13.00
Pittsburgh	13.50-14.00
St. Louis	8.50- 9.00

ANGLE BARS—STEEL	
Chicago	9.00- 9.50
St. Louis	7.75- 8.25

RAILROAD SPECIALTIES	
Chicago	9.50-10.00

LOW PHOSPHORUS		
Buffalo, billets and bloom crops	11.50-12.00	
Cleveland, billet, bloom crops	13.00-13.50	
Eastern Pa., crops	13.50-14.00	
Pittsburgh, billet, bloom crops	13.00-13.50	
Pittsburgh, sheet bar crops	12.00-12.50	

FROGS, SWITCHES		
Chicago	8.50- 9.00	
St. Louis, cut	8.50- 9.00	

SHOVELING STEEL		
Chicago	8.50- 9.00	
Federal, Ill.	6.75- 7.00	
Granite City, Ill.	6.50- 7.00	

RAILROAD WROUGHT	
Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	9.50-10.00
Chicago, No. 1, net	7.00- 7.50
Chicago, No. 2	8.50- 9.00
Cincinnati, No. 2	7.00- 7.50
Eastern Pa.	10.50
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	5.75- 6.25
St. Louis, No. 2	6.75- 7.25

SPECIFICATION PIPE	
Boston	3.00- 3.25
Eastern Pa.	8.00
New York, dealers	3.50- 3.75

BUSHELING		
Buffalo, No. 1	8.50- 9.00	
Boston, dealers	7.00- 7.50	
Chicago, No. 1	7.00- 7.50	
Cinci., No. 1, deal.	5.50- 6.00	
Cincinnati, No. 2	3.50- 4.00	
Cleveland, No. 2	6.50- 7.00	
Detroit, No. 1, new	6.50- 7.00	
Valleys, new No. 1		9.75

MACHINE TURNINGS	
Birmingham	4.50- 5.00
Boston, dealers	1.00
Buffalo	4.75- 5.25
Chicago	4.50- 5.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00- 5.50
New York, dealers	1.75- 2.00
Pittsburgh	6.75- 7.25
St. Louis	3.00- 3.50
Valleys	7.50- 8.00

BORINGS AND TURNINGS	
For Blast Furnace Use	
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.50- 7.00
Detroit	5.50- 6.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	5.50- 6.00

CAST IRON BORINGS	
Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.00- 5.50
Cincinnati, dealers	4.00- 4.50
Cleveland	6.75- 7.25
Detroit	5.50- 6.00
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	5.50- 6.00
St. Louis	3.00- 3.50

PIPE AND FLUES		
Cincinnati, dealers	4.00- 4.50	

RAILROAD GRATE BARS	
Buffalo	6.50- 7.00
Chicago, net	5.50- 6.00
Cincinnati	4.00- 4.50
Eastern Pa.	8.00
New York, dealers	4.00- 4.50
St. Louis	4.00- 4.50

FORGE FLASHINGS		
Boston, dealers	3.50	
Buffalo	8.50- 9.00	
Cleveland	7.00- 7.50	
Detroit	6.00- 6.50	

FORGE SCRAP		
Boston, dealers	3.50	
Chicago, heavy	9.50-10.00	
Eastern Pa.	9.00	

ARCH BARS, TRANSOMS	
St. Louis	10.00-10.50

AXLE TURNINGS		
Boston, dealers	4.00- 4.50	
Buffalo	7.00- 7.50	
Chicago, elec. fur.	7.50- 8.00	
Cleveland	6.00- 6.50	
Eastern Pa.	9.00	
St. Louis	6.00- 6.25	

STEEL CAR AXLES		
Birmingham	10.00-10.50	
Boston, ship. point.	9.50-10.00	
Buffalo	12.00-12.50	
Chicago, net	10.00-10.50	
Eastern Pa.	14.00-15.00	
St. Louis	10.00-10.50	

SHAFTING		
Boston, ship. point.	10.50-10.75	
Eastern Pa.	15.00-15.50	
New York, dealers	10.75-11.25	
St. Louis	11.00-11.50	

CAR WHEELS		
Birmingham, iron	8.50- 9.00	
Boston, iron deal.	5.75- 6.00	
Buffalo, iron	11.00-11.50	
Buffalo, steel	12.00-12.50	
Chicago, iron	9.50-10.00	
Chicago, rolled steel	9.50-10.00	
Cincinnati, iron	7.50- 8.00	
Eastern Pa., iron	11.00-11.50	
Eastern Pa., steel	12.50-13.00	
Pittsburgh, iron	10.00-10.50	
Pittsburgh, steel	13.50-14.00	
St. Louis, iron	7.25- 7.75	
St. Louis, steel	8.75- 9.25	

NO. 1 CAST SCRAP		
Birmingham	8.50- 9.50	
Boston, No. 2	6.00	
Boston, tex. con.	8.50- 9.00	
Buffalo, cupola	9.50-10.00	
Buffalo, mach.	10.00-10.50	
Chicago, agri. net	6.75- 7.25	
Chicago, mach. net	8.00- 8.50	
Chicago railroad net	7.25- 7.75	
Cinci., mach. cup.	8.50- 9.00	
Cleveland, cupola	10.75-11.25	
Detroit, net	8.50- 9.00	
Eastern Pa., cupola	11.00-11.50	
Pittsburgh, cupola	12.00-12.50	
San Francisco, del.	13.50-14.00	
Seattle	7.00- 8.50	
St. Louis, No. 1	6.50- 7.00	
St. L., No. 1 mach.	8.50- 9.00	

HEAVY CAST		
Boston, del.	4.50- 4.75	
Buffalo, break.	7.75- 8.25	
Cleveland, break.	7.50- 8.00	
Detroit, break.	6.50- 7.00	
Detroit, auto net	9.00- 9.50	
Eastern Pa.	9.50-10.00	
N. Y., break. deal.	5.00- 5.50	
Pittsburgh	10.00-10.50	

MALLEABLE		
Boston, consum.	10.00-10.50	
Buffalo	10.50-11.00	
Chicago, R. R.	9.00- 9.50	
Cincinnati, agri. del.	7.50- 8.00	
Cleveland, rail	10.75-11.25	
Detroit, auto	8.50- 9.00	
St. Louis, R. R.	7.50- 8.00	
Eastern Pa., R. R.	11.50-12.00	

RAILS FOR ROLLING	
5 feet and over	
Birmingham	9.50-10.00
Boston, dealers	8.00- 8.50
Buffalo	10.25-10.75
Chicago	9.50-10.00
Eastern Pa.	12.00-12.50
New York, dealer	7.50- 8.00
St. Louis	9.00- 9.50

LOCOMOTIVE TIRES	
Chicago (cut)	9.00- 9.50
St. Louis, No. 1	9.50-10.00

LOW PHOS. PUNCHINGS	
Buffalo	13.75-14.25
Chicago	9.50-10.00
Eastern Pa.	14.50-15.00
Pittsburgh	12.00-12.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum: 98-99%	Antimony: Spot, N. Y.	Nickel: Cathodes
Sept. 29	9.00	9.12½	8.75	51.30	51.25	3.60	3.45	3.90	*22.90	8.75	35.00
Oct. 1	9.00	9.12½	8.75	50.85	50.80	3.60	3.45	3.90	*22.90	8.87½	35.00
Oct. 2	9.00	9.12½	8.75	50.90	50.87½	3.60	3.45	3.90	*22.90	9.00	35.00
Oct. 3	9.00	9.12½	8.75	50.87½	50.82½	3.60	3.45	3.87½	*22.90	9.00	35.00
Oct. 4	9.00	9.12½	8.75	50.70	50.70	3.60	3.45	3.87½	*22.90	9.00	35.00
Oct. 5	9.00	9.12½	8.75	50.75	50.70	3.60	3.45	3.87½	*22.90	9.00	35.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.00c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.93½c
Los Angeles	4.45c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore *†	4.21c
Buffalo	4.00c
Boston (g)	4.55c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.70c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	
Baltimore	2.80c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore(c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland(h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

(b) Plus straightening, cutting and quantoty differentials.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

(f) Rounds only.

(g) 50 bundles or over.

(h) Outside delivery, 10c less.

‡Domestic bars.

*Plus quan. extras.

**Under 25 bundles.

*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 4

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
PIG IRON				
Foundry, 2.50-3.00 Silicon.	$14.79	3 0 0	$8.04	1 13 0
Basic bessemer	13.31	2 14 0*	7.55	1 11 0
Hematite, Phos. .03-.05	14.91	3 0 6	.....	.....
SEMIFINISHED STEEL				
Billets	$27.12	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	36.98	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$38.21	7 15 0	$26.77	5 10 0
Merchant bars	1.65c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.62c	7 7 6	.68c	3 1 6
Plates, †¼ in. or 5 mm	1.76c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm	2.04c	9 5 0	1.16c	5 5 0
Sheets, gal., 24 gage, corr.	2.48c	11 5 0	1.43c	6 10 0
Bands and strips	1.82c	8 5 0	.88c	4 0 0
Plain wire, base	2.04c	9 5 0	1.18c	5 7 6
Galvanized wire, base	2.48c	11 5 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.64c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.44	0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.64	3 7 6(a)	$13.94	210	$14.57	310	$25.55	63
Basic bessemer pig iron	16.64	3 7 6(a)*	12.28	185	13.40	285	28.18 (b)	69.50
Furnace coke	4.31	0 17 6	7.97	120	5.17	110	7.70	19
Billets	27.12	5 10 0	28.55	430	20.68	440	39.13	96.50
Standard rails	1.82c	8 5 0	2.10c	700	2.31c	1,100	2.43c	132
Merchant bars	1.89c	8 12 0	1.68c	560	1.16c	550	2.02c	110
Structural shapes	1.93c	8 15 0	1.65c	550	1.16c	550	1.98c	107.50
Plates, †¼-in. or 5 mm	1.89c	8 8 9	2.10c	700	1.47c	700	2.34c	127
Sheets, black	2.31c	10 10 0§	2.55c	850‡	1.63c	775‡	2.65c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.86c	13 0 0	4.50c	1,500	3.15c	1,500	6.81c	370
Plain wire	2.04c	9 5 0	3.39c	1,130	2.31c	1,100	3.18c	173
Bands and strips	2.06c	9 7 0	1.95c	650	1.47c	700	2.34c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January.

Bars

Bar Prices, Page 64

Pittsburgh—Bar users indicate they will require material, but are refusing to obligate themselves at this time. The market is steady, with carbon bars 1.80c, base, Pittsburgh, and hot rolled alloy bars, 2.45c, Pittsburgh. One large bar buyer in Detroit indicated last week it will have its new bar sizes ready for specification by Nov. 1.

Cleveland—An improved tone in the market has not yet led to larger orders, although the tonnage so far this month is slightly ahead of the average in September. Normally, automobile manufacturers take 65 per cent of the steel bar output in this district, but they continue to lag, and most specifications are coming from miscellaneous users. A printing press manufacture purchased 35 tons. The Willys-Overland Co., Toledo, O., has been authorized by federal court to build 5000 to 15,000 passenger cars and trucks, steel for which is expected to be purchased early in November; and the government has distributed an order for 2000 trucks to Ford, Chevrolet and Dodge. Occasional fill-in orders are being received for steel for truck production. Some of the partsmakers recently awarded contracts by automobile manufacturers have not yet received releases.

Chicago—Despite some small improvement in automotive bar orders, total business shows little change. Better demand from the farm implement industry is slow to appear but increased orders from this direction and from automotive interests are in prospect for coming weeks. Miscellaneous consumers show little change in their buying and in practically all directions there is a lack of interest in contracting beyond early needs. Soft steel bars continue 1.85c, base, with rail steel 1.75c and bar iron 1.80c, Chicago.

Boston—Buying continues in small lots, specifications being slightly heavier. Consumer operations, however, have not improved materially. Commercial steel bars are unchanged at 2.20c, Boston.

New York—Commercial steel bar tonnage is moving sluggishly, with no particular activity in any of the leading consuming groups. The railroads and the bolt and nut manufacturers appear to be specifying particularly light. The base price is 2.13c, New York.

Philadelphia—New specifications are coming out slowly. Orders are possibly a little more numerous, but total volume is about the same. The base is unchanged at 1.80c, Pittsburgh, or 2.09c, Philadelphia.

Washington—Bureau of supplies and accounts, navy department, will take bids Oct. 12 on 103,320 pounds of rough machined steel forgings for rudder tubes; 43,000 pounds of round No. 1 grade corrosion-resisting bar steel, and 74,000 pounds of grade No. 7.

Plates

Plate Prices, Page 64

Pittsburgh—Pittsburgh Coal Co. last week awarded a contract to Dravo Contracting Co. for a 148 x 34 x 6-foot Ohio river towboat, which will take about 325 tons of plates. A small tonnage of plates will be required on Oct. 19 bids to the Norfolk, Va., engineers for a 100 x 30 x 7-foot oil barge, and bids were taken Oct. 6 at St. Louis on 500 tons of plates for ten pontoons and 600 feet of dredge pipe. Inquiries are appearing for small water tanks which are financed by federal funds. The market continues steady at 1.80c, base.

Cleveland—Extensive lake ship repair work is being figured but plate manufacturers have not been able to obtain a definite line on requirements and when purchases will be made. In some instances the repair programs will not be decided until after the close of shipping. Manufacturers of small tanks place occasional carloads.

Chicago—While large orders for plates are lacking in this district, fabricators report an increasing volume of inquiries and awards for various projects involving small tonnages. Gas holders for sewage disposal plants at Madison, Wis., and Peoria, Ill., involving about 450 tons of plates, have been placed. Sewage plant projects are fairly active as a result of PWA loans and a moderate tonnage of plates will be required for gas holders and tank covers.

Boston—Small plate orders are slightly heavier, with more tanks and standpipes being figured, notably for Lowell, Mass. McClintic-Marshall Corp., Bethlehem, Pa., will erect a 165-ton water tank at Vergennes, Vt. Plates are 2.20c, Boston.

Philadelphia—The trend of plate business here recently has been downward. Tank buying is spotty and little interest is being manifested by the railroads. It is now understood that the Reading Co. will not undertake important car repairs this month. The base price is 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

Washington—The bureau of supplies and accounts, navy department, has awarded to Joseph T. Ryerson & Son Inc., Chicago, 66 tons of plates, bid Sept. 4 at 2.50c per pound, f.o.b. cars, Pittsburgh, the product of a Pittsburgh district mill. The bureau will receive bids Oct. 16 for 23,000 pounds of grade M, black medium steel plates.

New York—Placing of steel by one private yard for navy work features an otherwise dull plate market.

Contracts Placed

1400 tons, tanks for Standard Oil Co. of California; 3000 tons for six to Consolidated Steel Corp., Los Angeles; 1400 tons for five to Western Pipe & Steel Co., San Francisco.

685 tons, three oil tanks, Sinclair Refining Co., Tremley Point, N. J., to Chicago Bridge & Iron Works, Chicago.

390 tons, standpipe, Kenosha, Wis., to Graver Tank & Mfg. Corp., Chicago; reported last week as unstated tonnage.

325 tons, stern wheel tow boat for Pittsburgh Coal Co., Pittsburgh, to Dravo Contracting Co., Neville Island, Pittsburgh, hull to be 148 x 34 x 6 feet.

275 tons, five oil tanks, Tide Water Oil Co., Syracuse, N. Y., to Hammond Iron Works, Hammond, Ind.

250 tons, gas holders and tank covers, Madison, Wis., sewage disposal plant, to Graver Tank & Mfg. Corp., East Chicago, Ind.

200 tons, four booster cars, Fort Peck dam, Montana, to unnamed interest.

200 tons, gas holder, Peoria, Ill., sewage disposal plant, to Graver Tank & Mfg. Corp., East Chicago, Ind.

100 tons, elevated watertank, Fairport, O., to Chicago Bridge & Iron Works, Chicago.

100 tons, two 150-foot smokestacks, Standard Oil Co., Richmond, Calif., to Berkeley Steel Construction Co., Berkeley, Calif.

Contracts Pending

6000 tons, aqueduct, metropolitan water district, Los Angeles; bids opened.

100 tons, water tank, Stillwater, N. Y.; bids Oct. 18.

Sheets

Sheet Prices, Page 64

Pittsburgh—The advanced rate of buying in sheets noted each week since Labor day was halted last week. With trial specifications now placed for sizes for 1935 automobile bodies, sheet producers are awaiting tonnage business. Under the new "commodity clause" covering revised extras in cold-rolled strip steel, cold-rolled fender stock has been listed as unchanged at 2.90c for 14 gage and 3.30c for 20 gage. Likewise, 10 gage cold-rolled at 2.50c, and 20 gage cold rolled at 2.95c are hold-

ing for the balance of the quarter. There has been no change in hot-rolled sheet prices.

Cleveland — Specifications from the automobile industry now are almost exclusively for materials for new models. The number is increasing, but few orders exceed 100 tons. Producers, however, feel confident that buying in larger volume will develop this month. Demand for enameling stock for manufacturers of household equipment is fairly steady. Sheet mills in this district are operating at 25 per cent.

Chicago—Sheet demand is slow and mills see little possibility of a material pick-up in business or operations this month. While some automotive orders have been received for preliminary work on new models, heavier buying is likely to be deferred until November. The improved outlook in the farm implement industry has yet to develop substantial sheet orders. Galvanized roofing material is in slow demand.

Boston—Sheet buyers have in some instances bought sparingly to fill depleted stocks, but few have covered far into the last quarter. Small tank fabricators and metalworking consumers are slightly more active. The October total is expected to top the volume of the last two months.

New York—Sheet sellers report less activity, although the slowing up of the past few days may be of no special significance, for the market has been generally spotty for a considerable time.

Philadelphia—Following a spurt in specifications around the close of last month with consumers covering before new extras went into effect, there has been a leveling off in sheet demand here, notwithstanding improved buying by stove makers.

Buffalo—Improvement in sheet demand still is lacking. Buffalo mills are operating at 15 per cent.

Cincinnati — District sheet mills are operating close to September levels, principal consumers failing to increase specifications.

St. Louis—Demand for sheets continues disappointing, though the movement of galvanized roofing has improved.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—More activity is evident in the cold-finished bar market, as both automotive parts suppliers and jobbers have been increasing their stocks slightly. Tonnage buying for 1935 models is expected within three to four weeks. At Pittsburgh, carbon cold-drawn bars hold at 2.10c; and alloy cold drawn, 2.95c.

Railroads

Track Material Prices, Page 65

With most railroads restricting steel purchases to a minimum, interest is centered on the outcome of the freight rate increase petition. Some roads have indicated that more liberal buying would follow a favorable verdict on this request and the general practice seems to be to defer making commitments until this question is decided.

A large proportion of the 800,000 tons of rails purchased this year with government funds still are unlaid. One eastern road, for example, which purchased 50,000 tons has between 35,000 and 40,000 tons on hand unlaid. Officials of this road recently stated that this large inventory would preclude new rail buying in 1935.

Domestic freight car orders in September, involving seven cars, were the lightest so far this year. They compared with 105 in August, 19 in July and 1835 in June, and brought the total for the first nine months up to 23,390. Further comparisons follow:

	1934	1933	1932	1931
Jan.	152	3	159	100
Feb.	19,725	0	35	50
March	30	5	105	2,166
April	800	50	0	2,798
May	717	8	60	20
June	1,835	500	0	1,910
July	19	306	25	617
Aug.	105	202	5	1,304
Sept.	7	23	1,298	705
9 mo.	23,390	1,097	1,687	9,669
Oct.	.....	514	0	980
Nov.	.....	533	2	35
Dec.	.....	316	50	11
Total	.....	2,460	1,739	10,694

Car Orders Placed

United States department of interior, two flat cars for bureau of reclamation, Denver, to American Car & Foundry Co.

Locomotives Placed

National Railways of Columbia, one oil-burning locomotive of 2-8-8-2 type to Baldwin Locomotive Works, Eddystone, Pa.

Rail Orders Placed

Chesapeake & Ohio railroad, Cleveland, 300 tons of tie plates to various producers.

Locomotives Pending

Chicago & Illinois Midland, two 0-8-0 type locomotives, contemplated.

Pipe

Pipe Prices, Page 65

Pittsburgh — General contractor bids recently were opened on the Fort Peck dam, Montana, spillway, which includes 69,000 feet of 6-inch, 52,000 feet of 8-inch, 3000 feet of 12-inch and 6500 feet of 18-inch pipe, for drains. Low general contract bid was received from Hardwick & McGlone, Kansas City, Mo. This contractor bid 45c per foot on the 6-inch and 60c on the 8-inch. Pittsburgh makers of oil country goods are noticeably less active than a month ago.

Cleveland—Award of 500 tons of 24 and 30-inch cast pipe for the second section of a Columbus, O., sewer main is expected shortly. For the first section 1000 tons recently was placed. Public work requirements generally are limited to small lots.

Boston—Close to 1000 tons of cast pipe for Vergennes, Vt., went to a New Jersey foundry. Barnstable, Mass., has bids on more than 1000 tons. Indications are that cast pipe buying will be heavier than usual for the fall period, material to be used in emergency relief projects later. A large steel pipe project, long planned, the Boston Gas Co. booster line, may go ahead in the near future.

New York—Specifications are being compiled for a cast iron pipe project for a Westchester county, New York, municipality requiring several thousand tons, with indications bids will be asked on the pipe in about two weeks. Buying is light.

Philadelphia—A large eastern pipe producer has resumed after complete suspension for some time, now operating at 25 per cent.

Birmingham, Ala.—Current awards of cast iron pipe are lagging. Pipe producers give intimation of steady production through the winter, some sections of the country being able to continue work the year through.

Cast Pipe Placed

600 tons, Chester, N. J., to United States Pipe & Foundry Co., Burlington, N. J.
147 tons, 4 and 6-inch, class 150, Santa Monica, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

Steel Pipe Placed

290 tons, 22-inch, 14 gage, metropolitan water district, Los Angeles, to American Pipe & Steel Corp., Los Angeles.

Cast Pipe Pending

653 tons, 4 to 8-inch, class 150 and 250, east bay municipal utility district,

WHERE GEARS TAKE PUNISHMENT--*SPECIFY*

FOR gears requiring an especially hard, durable steel—tractor ring gears, and other automotive ring gears—Illinois produced S. A. E. 4615, a nickel-molybdenum case hardening steel which can be treated at relatively low cost.

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For many applications a single quench is adequate to provide physical properties ordinarily obtainable in other steels only with double quench.

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ILLINOIS *alloy* STEELS

ALWAYS DEPENDABLE

Oakland, Calif.; bids Oct. 10.
500 tons, 10-inch, Bethlehem, Albany county, New York; bids Oct. 15.
150 tons, Moundville, Ala., waterworks; bids Oct. 18.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

Bolt and nut producers are receiving the usual quarterly contracts from jobbers and other users. These are being closed on at the new discount of 70-10-10 off for carriage and machine bolts. Rivets reflect a slower market but hold at 2.90c, Pittsburgh or Cleveland, for large sizes, and 70-5 off list on the smaller dimensions. Wrought washers continue at 6.00 to 6.25 off list, all basing points.

Specifications continue slow and show little change from previous activity. Farm implement manufacturers are consuming moderately larger lots.

On 154 tons of medium steel rivets for the navy, Philadelphia, all bids were 4.19c and 4.28c, the latter for delivery.

BUILT BY MORGAN *Engineering* » »

RECOGNIZING that less heat loss between ingot mold and soaking pit is a direct result of reduction in stripping time, steel executives who have already installed Morgan Ingot Strippers know that they have definitely lowered their cost of production . . . extended their margin of profit thereby. Shown here close-up is one of the two Morgan 200-ton 80′ 2″ span duplex screw type Ingot Strippers in use at the Youngstown Sheet & Tube Company's Campbell Works, in operation stripping small end up or regular type ingots. Morgan builds and has in successful operation Strippers for stripping big end up ingots as well. Information regarding Morgan Screw Type Ingot Strippers or any other modern steel mill equipment will be supplied upon request.

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PLATE MILLS
CONTINUOUS MILLS
STRUCTURAL MILLS
ELECTRIC TRAVELING CRANES
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LADLE CRANES
SOAKING PIT CRANES
STEAM HAMMERS
STEAM HYDRAULIC FORGING PRESSES
SPECIAL MACHINERY FOR STEEL MILLS

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DESIGNERS
MANUFACTURERS
CONTRACTORS

THE MORGAN ENGINEERING COMPANY
New York, 11 W. 42d St. ALLIANCE, OHIO *Pittsburgh, 1420 Oliver Bldg.*

Strip Steel

Strip Prices, Page 65

Pittsburgh — A total of 722 tons of steel ceiling strips are required for the Fort Peck, Montana, dam spillway, for which bids recently were opened. Unit bids on this tonnage of strip ranged from 0.045c per pound, from Hardwick & McGlone, Kansas City, Mo., to 0.051c from Six Companies of Washington Inc.; 0.06c by A. Guthrie & Co., and 0.07c by Central Bridge & Construction Co., Kansas City.

Last week a revised "commodity classification" on cold-rolled strip steel was adopted for the remainder of the year. It applies to strip from 2 to 23 15/16 inches wide, and is designed as a temporary expedient until revised extras on cold-rolled strip steel can be officially determined. Placing cold-rolled strip, as this classification does, in the same category as fender stock and cold rolled sheets, actually makes a reduction in price on many sizes of as much as $25 a ton. Cold-rolled strip steel continues based on 2.60c, Pittsburgh or Cleveland, and hot rolled strip at 1.85c, Pittsburgh. Demand is improving.

Chicago — Strip demand continues slow and orders from the automotive industry so far have been light. While some prospective betterment in the latter buying is seen for this month, delays in starting work on new models are expected to defer heavier purchasing until November. Miscellaneous strip consumers show occasional gains in their orders but total tonnage lacks major improvement.

Boston — Cold-rolled strip is slightly more active. Consumers are not stocking strip, but buying in small lots for immediate requirements.

Philadelphia — Strip tonnage is about on a parity of a week ago. Buying is of hand-to-mouth character, for immediate requirements, consumers stocks being considerably depleted. Hot strip is unchanged at 2.14c, Philadelphia, and cold strip at 2.89c.

Quicksilver

New York — Quicksilver prices have eased on reported bookings of round lots down to $73 a virgin flask of 76 pounds. Small lots are now quotably $74.50 a flask, and round lots $73.50 to $74.

Shapes

Structural Shape Prices, Page 64

Pittsburgh—Postponement of bids on 17,000 tons of structural shapes for the New York courthouse, and the 9000-ton Boston parcel post building, both of which were scheduled for closing last week, has been a dissappointment to structural fabricators. In the meantime, inquiries and contracts are lighter. Plain material holds at 1.80c, base, Pittsburgh.

Cleveland—Republic Steel Corp. is taking tentative bids for its proposed strip mill building which will require approximately 2000 tons of shapes, if authorized. Final decision depends on whether the Republic-Corrigan, McKinney Steel Co. merger is ratified. Steel for Chesapeake & Ohio's dock and unloader at Toledo, O., contracts for which were noted as placed last week, will be purchased outside this district, for the freight haul. This includes 800 tons of shapes, 250 tons of piling and 200 tons of concrete bars. An electrical equipment manufacturer in this city has awarded a contract for a building requiring approximately 250 tons of shapes and 75 tons of reinforcing, details of which have not been disclosed. General structural work is quiet.

Chicago—Spencer, White & Prentis Inc., Detroit, are low bidder on the general contract for the Trempealeau, Wis., dam, involving 2200 tons of structurals in addition to 1472 tons of piling and 311 tons of reinforcing bars. Plans for the Winona, Minn., dam are expected to be received soon. The market otherwise is quiet.

Boston—Bids on the Boston parcel post building superstructure, requiring 9000 tons, were postponed to Oct. 16 from Oct. 2. Structural inquiry continues active in New England with awards heavier, including 810 tons for a crane building for a Groton, Conn., shipyard. Bridges placed require 1500 tons.

Philadelphia—Included in new inquiries is 2000 tons for the Delaware river bridge commission. The tonnage involves 500 tons of miscellaneous structural pieces and approximately 1500 tons of 18-inch ship channels used for supporting track. Award of approximately 2800 tons for a DuPont building project at Edgemoor, Del., is reported. Shapes are 1.90c, Bethlehem, or 2.00½c, Philadelphia.

Birmingham, Ala.—Structural steel fabricating shops are fairly busy. Virginia Bridge & Iron Co., Roanoke, Va., will begin immediately the fabrication of approximately 800 tons for a bridge for the Seaboard Air Line railroad, near Richmond, Va.

New York—Structural steel awards are light with bids on the

Shape Awards Compared

	Tons
Week ended Oct. 6	19,984
Week ended Sept. 29	14,044
Week ended Sept. 22	20,028
This week in 1933	14,984
Weekly average, 1933	9,296
Weekly average, 1934	16,722
Weekly average, September	12,154
Total to date, 1933	584,567
Total to date, 1934	685,625

MODERN designs often call for artistic applications of steel, as in exposed shafting or special parts.

Appearance counts—in machines as well as in men—and the practical product of today combines beauty and utility, pleasing the eye while performing its work. This new trend is reflected in the latest types of equipment by streamline design, simplicity of form, and highly polished surfaces.

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This economical grade of B & L bar stock gives you a class of steel that assures the maximum degree of smoothness and mirror-like finish, free from even the most minute surface blemishes.

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17,000 tons downtown, Manhattan federal building postponed to Oct. 24 from Oct. 2. A New York Central railroad bridge, East View, N. Y., 500 tons, has been placed. Small state bridges for New York and New Jersey will require a total of close to 1000 tons.

Shape Contracts Placed

2800 tons, Krebs Pigment & Color Co., Edgemoor, Del., subsidiary of E. I. du Pont de Nemours Inc., Wilmington, Del.; reported placed with an unnamed fabricator.

2300 tones, state bridge, Lynn-Revere, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

1400 tons, Rundel memorial, Rochester, N. Y., to F. L. Heughes Co., Rochester.

1050 tons, 800 tons of shapes for car unloader, Toledo, O., for Chesapeake & Ohio railroad, Cleveland, to Industrial Brownhoist Corp., Bay City, Mich.; 250 tons piling for project to Empire Construction Co., Baltimore.

1000 tons, Falls bridge, Merrimack river, Lawrence, Mass., to Phoenix Bridge Co., Phoenixville, Pa.; through Central Construction Co., Lawrence, Mass.

810 tons, crane structure building, Electric Boat Co., Groton, Conn., to American Bridge Co., Pittsburgh.

760 tons, state bridge over Ninety-Fifth street and Stony Island avenue, Chicago, to Hansell-Elcock Co., Chicago.

720 tons, spans, James river bridge, Seaboard Airline railway, Virginia, to Virginia Bridge & Iron Co., Roanoke, Va.

500 tons, highway bridges, Iowa, to McClintic-Marshall Corp., Bethlehem, Pa.

500 tons, bridge, New York Central railroad, East View, Westchester county, New York, to American Bridge Co., Pittsburgh.

450 tons, three bridges in Dunn county, Wisconsin, to Worden-Allen Co., Milwaukee.

450 tons, highway bridges, Minnesota; 225 tons to McClintic-Marshall Corp., Bethlehem, Pa., 125 tons to Minneapolis-Moline Power Implement Co., Minneapolis, 100 tons to American Bridge Co., Pittsburgh.

410 tons, bridge, Yellowstone river, Billings, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis.

400 tons, state highway bridge, Billings, Mont., to Minneapolis-Moline Power Implement Co., Minneapolis.

390 tons, high school, Reading, Pa., to McClintic-Marshall Corp., Bethlehem, Pa.

390 tons, Anacostia junior high school, Washington, to Shippers' Carline Inc., Milton, Pa.

325 tons, bridge, Mobile, Ala., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, sewage disposal plant, Milwaukee, to McClintic-Marshall Corp., Bethlehem, Pa.

275 tons, bridge, Plymouth, N. H., to Lackawanna Steel Construction Corp., Buffalo.

275 tons, state crossing in Eagle county, Colorado, to unnamed interest.

270 tons, bridge, Lancaster, Ky., to Vincennes Bridge Co., Vincennes, Ind.

265 tons, power house, United States Industrial Alcohol Co., Curtis Bay, Md., to McClintic-Marshall Corp., Bethlehem, Pa.

260 tons, bridge, Hanover, N. H., to American Bridge Co., Pittsburgh.

250 tons, building at Selby, Calif., to Minneapolis-Moline Power Implement Co., Minneapolis.

240 tons, state highway bridge, Hoosick Falls, N. Y., to National Bridge Co., Long Island City, N. Y.

225 tons, building at Pittsburgh for Meadow Gold Dairies Inc., to McClintic-Marshall Corp., Bethlehem, Pa.; through Henry Busse, Pittsburgh, general contractor.

220 tons, bridge, Dunn county, Wisconsin, to Wisconsin Bridge & Iron Co., Milwaukee.

220 tons, bridge over Los Angeles river for Los Angeles county, California, to Consolidated Steel Corp., Los Angeles.

205 tons, gymnasium and shop building, state school, Coxsackie, N. Y., to Belmont Iron Works, Philadelphia.

200 tons, artillery storage shed, Natick, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

175 tons, powerhouse, Washington State college, Pullman, Wash., to Poole & McGonigle, Portland; Ross B. Hammond Co., Portland, general contractor.

160 tons, building for Atchison Graphite Co., Niagara Falls, N. Y., to McClin-

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tic-Marshall Corp., Bethlehem, Pa.
160 tons, state highway bridge, Montoursville, Pa., to Lackawanna Steel Construction Corp., Buffalo.
130 tons, bridge for Southern Pacific, San Jose, Calif., to American Bridge Co., Pittsburgh.
130 tons, high school building, Norwalk, Calif., to Virginia Bridge & Iron Co., Roanoke, Va.
120 tons, Nichols school, Endicott, N. Y., to Bethlehem Contracting Co., Bethlehem, Pa.
110 tons, bridge over Mill creek, Cincinnati, to American Bridge Co., Pittsburgh.
100 tons, bridge in Yellowstone National Park, Wyo., to unnamed interest.

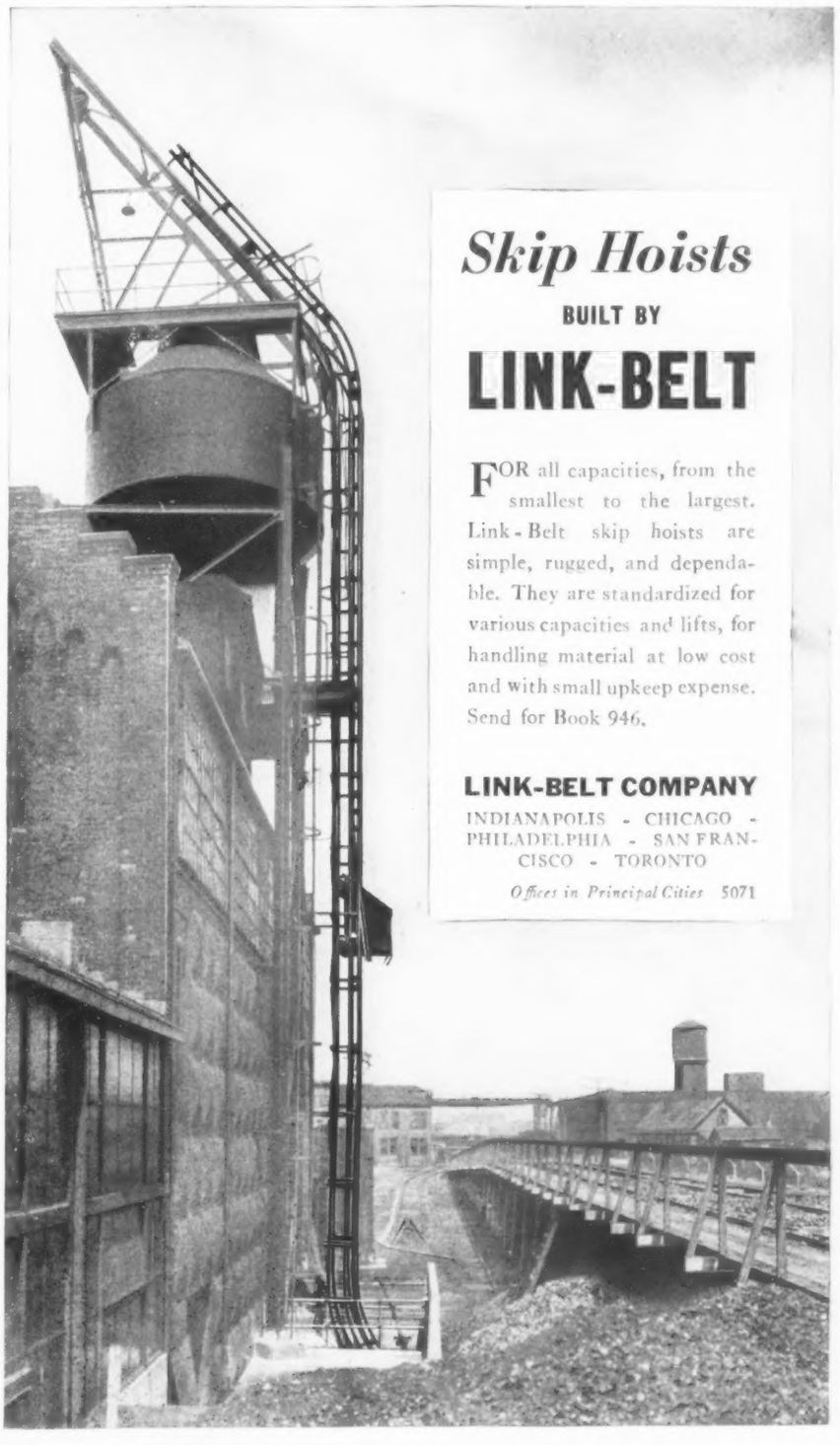
Shape Contracts Pending

17,000 tons, superstructure and foundations, federal building, Vesey street, Manhattan, New York; bids postponed from Oct. 2 to Oct. 24.
9000 tons, superstructure, parcel post building, Boston; bids postponed from Oct. 5 to Oct. 16.
2500 tons, bridge, Lake of the Ozarks, Missouri; bids by Missouri state highway commission, Jefferson City, Oct. 16. Sverdup & Parcel, St. Louis, engineers.
2200 tons, also 1472 tons piling, 311 tons reinforcing bars, dam, Trempealeau, Wis.; Spencer, White & Prentis Inc., Detroit, low for general contract.
2000 tons, approximately, including 500 tons of miscellaneous structural work and close to 1500 tons of 18-inch ship channels, for the Delaware river bridge commission, Philadelphia; bids to be opened Oct. 12.
1600 tons, steel piling, cofferdam, lock and dam No. 2, Brown's Landing, Upper Cape Fear river; bids Oct. 9 to United States engineer, Wilmington, N. C.
1400 tons, highway bridge, Jackson county, Illinois.
700 tons, auditorium, San Jose, Calif.; bids opened.
500 tons, state bridge over Rock river, Prophetstown, Ill.
460 tons, two state highway bridges, Roscoe, Nebr., and Broule, Nebr.
380 tons, extension to Mystic river bridge, Chelsea, Mass.
350 tons, Colorado state highway bridges.
300 tons, bridge, Augusta, Wis.; bids Oct. 16.
300 tons, bridge, Lehigh Valley railroad, South Plainfield, N. J.; bids Oct. 25.
270 tons, state bridge, Wynochee river, Grays Harbor county, Washington; Sheble Construction Co., Seattle, awarded general contract.
265 tons, high school, East Rockaway, N. Y.
246 tons, bridge, route 50, section 8A, Hampton, Hunterdon county, New Jersey, Manson Contracting Co., Bound Brook, N. Y., low.
200 tons, power house, reformatory, Elmira, N. Y.; W. E. Wark Co., Philadelphia, general contractor.
200 tons, addition to Bowen building, Washington.
200 tons, addition to Scott Paper Co. plant, Chester, Pa.
150 tons, bridge, Lynxville, Wis.; bids Oct. 16.
150 tons, immigration building, Ellis Island, N. Y.
150 tons, grade elimination, Delaware & Hudson railroad, Windsor, N. Y.
140 tons, bridge, Lehigh Valley railroad, Central avenue, Clark township, Union county, New Jersey.
135 tons, bridge, Nansemond river, route 460, Suffolk, Va.; bids Oct. 23.
100 tons, postoffice, Lodi, Calif.; bids soon.

Metallurgical Coke

Coke Prices, Page 65

Extension of Connellsville foundry and furnace coke prices for fourth quarter has not led to improved buying. By-product coke producers report a fairly steady demand for domestic sizes. Foundry grades of beehive coke are $4.60, and premium grades, $5.10, Connellsville, Pa. Furnace coke is available at $3.60 for contracts, and $3.85 for spot shipment, Connellsville. Foundry coke shipments in the middle west have improved moderately, reflecting gains in operations of some consumers.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Reinforcing

Reinforcing Bar Prices, Page 65

Pittsburgh—Unit bids on 18,000 tons of new billet steel bars for the Fort Peck dam, Montana, spillway reveal the following general contractor estimates: Hardwick & McGlone, St. Louis, bid .0375c per pound, as did A. Guthrie & Co., St. Paul, bidding jointly with five other contractors. Six Companies of Washington Inc., San Francisco, bid 0.04c per pound, and Central Bridge & Construction Co., Kansas City, 0.0475c per pound. Interest in the market here centered on the award of 1000 tons of mesh, bars and steel sash for the Chevrolet Motor Co. plant at Baltimore, through Consolidated Engineering Co. The new billet bar market is steady at 2.05c, Pittsburgh, to consumer.

Cleveland—Several small industrial jobs were placed during the week, requiring a total of 300 tons of reinforcing material. Public works requirements are lighter than in several months.

Chicago—Bids have been opened on Cook county, Illinois road work involving about 500 tons of bars. Shipments against old orders for highway construction and other projects are fairly steady and market activity generally compares favorably with that of the preceding several weeks. While the volume of private business remains relatively light, definite improvement has been recorded in this district since early this year and compared with a year ago.

Boston—The parcel post building superstructure, Boston, closing Oct. 16, will require close to 500 tons. Small-lot buying is active and an award for a Boston hospital unit includes 160 tons.

New York—Except for 680 tons for Bronx market stores, awards are light. Several thousand tons, however, are active including the Manhattan federal building and New York city park department needs.

Philadelphia—Pennsylvania state road work continues outstanding in the market, coming out at the rate of about 200 to 300 tons a week. Billet steel bars, cut lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

Reinforcing Steel Awards

500 tons, powerhouse, Seattle's Skagit river project, to Northwest Steel Rolling Mills Inc., Seattle.

390 tons, instead of 275 tons, as previously reported, wind tunnel, Langley Field, Virginia, to Kalman Steel Corp., Bethlehem, Pa., through J. B. Eurell Co., Philadelphia, general contractor.

300 tons, mesh, highway, Oswego county, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Manitou Construction Co., Rochester, N. Y.

225 tons, mesh, highway, Ontario county, New York, to American Steel & Wire Co., New York; through John Bellardino, Seneca Falls, N. Y.

200 tons, deck, Toledo, O., for Chesa-

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Concrete Awards Compared

	Tons
Week ended Oct. 6	2,409
Week ended Sept. 29	2,162
Week ended Sept. 22	4,281
This week in 1933	7,516
Weekly average for 1933	3,232
Weekly average, 1934	4,623
Weekly average, September	2,604
Total to date, 1933	144,521
Total to date, 1934	189,533

peake & Ohio railroad, Cleveland, to Empire Construction Co., Baltimore.

175 tons, hospital building, Boston, to Concrete Steel Co., New York.

124 tons, school, Coalinga, Calif., to Soule Steel Co., San Francisco.

100 tons, powerhouse, Washington State college, Pullman, Wash., to Soule Steel Co., Portland; Ross B. Hammond Co., Portland, general contractor.

100 tons, two state bridges in Wyoming, to unnamed interests.

100 tons, sewage disposal plant, Clinton, Ill., to Kalman Steel Corp., Bethlehem, Pa.

100 tons, storage tank foundation for Gulf Refining Co., awarded through Thomas Earle & Sons Co., Philadelphia, general contractor, to Kalman Steel Corp., Bethlehem, Pa.; this foundation is for a tank now in use.

100 tons, two incinerators, Queens, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Wilcox Construction Co.

Reinforcing Steel Pending

18,000 tons, Fort Peck dam, Mont., spillway; Hardwick & McGlone, Kansas City, low on general contract at $7,918,930. Central Bridge & Construction Co., Kansas City, Mo., second low at $8,619,473.

8000 tons, specification No. 75, metropolitan water district, Los Angeles; bids Oct. 31; this is in addition to the 14,200 tons on which bids were opened last week.

2000 tons, bars and mesh, federal building, Vesey street, Manhattan, New York; bids Oct. 24, postponed from Oct. 2.

1100 tons, George Washington high school, South San Francisco, Calif.; bids opened.

1000 tons, comprised of new billet steel bars, mesh and steel sashes, Chevrolet Motor Co. assembly plant, Baltimore, Consolidated Engineering Co., Baltimore, subcontractor.

850 tons, Hart's Island piers for Triboro bridge, New York; Woodcrest Construction Co. low.

500 tons, bridges, Cook county, Ill.; bids closed.

500 tons, superstructure, parcel post building, Boston; bids Oct. 16, postponed from Oct. 5.

311 tons, dam, Trempealeau, Wis., Spencer, White & Prentis Inc., Detroit, low for general contract.

300 tons, miscellaneous state road in Pennsylvania, on which bids were opened Sept. 28; S. J. Groves, Ridgewood, N. J., and L. H. Williams, York, Pa., among general contractors low on this work.

275 tons, Chicago sanitary district construction; McKay Engineering & Construction Co., Chicago, low for general contract.

225 tons, mesh and bars, paving and buildings, airport, Warwick, R. I.

216 tons, transmission line, Skagit power project, Seattle; bids in.

200 tons, approximately, miscellaneous state road work in Pennsylvania; general contractors' bids opened Oct. 5.

115 tons, highway route S-49, section 4, South Dennis, Cape May county, New Jersey; bids Oct. 22.

Coke By-Products

Coke By-Product Prices, Page 65

New York—Supplies of xylol for prompt shipment by some distributors are short. Demand for toluol also is increasing, and with output still curtailed little spot material is expected to be available at the end of this month. Benzol demand is steady. Phenol is unchanged.

Ferroalloys

Ferroalloy Prices, Page 66

Little change is noted in ferromanganese specifications, as compared with a week ago, although better than a month ago. The market is steady at $85, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent is $26, furnace, for quantities up to 50 tons and $24 for lots of 50 tons and over.

Tin Plate

Tin Plate Prices, Page 64

Pittsburgh—A further gain in tin

When at A-Century-of-Progress in Chicago see the ERIE hammer and press operating at the Chrysler Motors exhibit.

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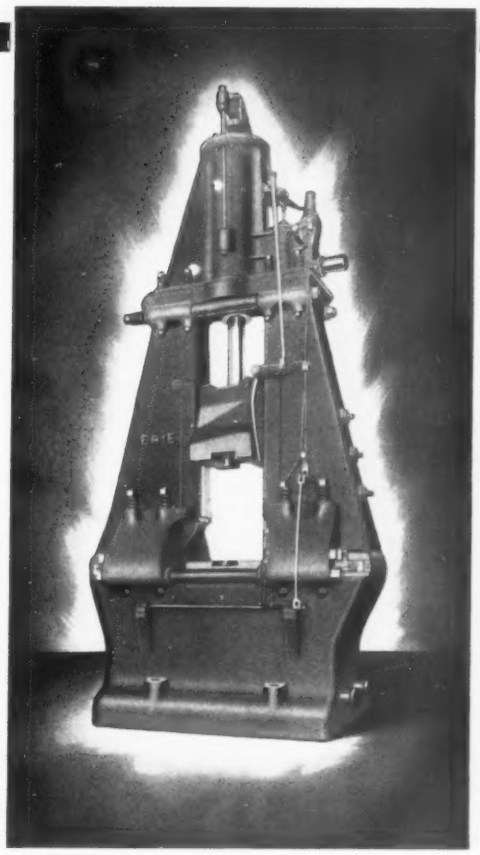

Personally, we don't profess to know; your guess is as good as ours. Most of the experts, however, say we are headed for inflation. If they are right, you should invest now in goods—raw materials or equipment—forging bars or hammers. But steel rusts, and interest charges pile up, and if you buy steel, and if the experts are wrong, you take a loss.

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plate operations places the average for the industry at 50 per cent. A rising rate of tin plate operations at this time is unusual, but there is no indication of an early decline. One leading canmaker consumed more tin plate in September than in any other month of its history. At $5.25 per base box, standard tin plate is steady, as are tin mill sizes of black sheets at 2.75c, base, Pittsburgh. A sustained volume of export business is noted in the East.

Wire

Wire Prices, Page 65

Pittsburgh — Eliminaton of the less-carload charge for wire nails has been a distubing influence in the market. Wire product buying shows encouraging tendencies, despite the low aggregate tonnage in the market. Orders are slightly more numerous, and are coming from jobbers and manufacturers. On a Pittsburgh or Cleveland base, the market is quoted $2.60 for wire nails, and 2.30c for plain wire, with spring wire generally 3.20c.

Chicago—The wire market is making slow progress. While September brought a slight gain in business compared with August, the October outlook is only moderately favorable and the month's outcome will depend to a large extent on the development of better operations among the automotive interests and other important wire consumers. Forward buying of manufacturers' wire generally is lacking.

Boston—Wire specifications are slightly heavier. Buying, however, is generally in small lots to round out depleted stocks and consumers are frequently asking immediate delivery. Mill drawing operations have gained, but schedules are still spotty. Plain wire is steady and unchanged at 2.40c, Worcester.

Philadelphia—Nails and other wire products are moving in restricted volume. While nail specifications are better than a month ago they are still far under normal for this season of the year. Prices are unchanged.

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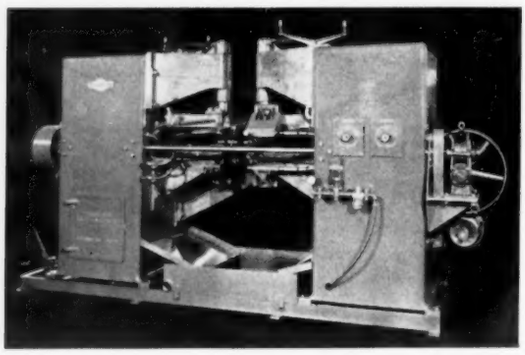

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Product..... Metal.....

Approximate dimensions .....

Desired production per hour .....

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Pig Iron

Pig Iron Prices, Page 66

Pittsburgh — Merchant pig iron sellers here have entered the fourth quarter with still no break evident in the poor rate of pig iron demand. Foundries are inclined to buy only as they require iron and the inroads of scrap, now in a declining market, severely restrict pig iron use. On a Neville Island base, foundry pig iron remains quoted $18.50, bessemer, $19, and basic iron, $18.

Cleveland—Producers are hopeful that October will develop improvement in pig iron demand, though the lack of forward commitments makes it difficult for them to gage requirements. Currently, orders are restricted to small, spot lots, with volume unchanged from the low level of recent weeks. Automobile foundries are expected to increase their purchases as the month progresses.

Chicago — Pig iron orders and shipments continue to improve gradually in keeping with a moderate betterment in foundry schedules. An acceleration in the upturn in the market is seen for the next several weeks with automotive and farm implement foundries scheduled to resume heavier operations at that time. New business still is in small individual lots but the number of such orders shows a gain since a

month ago. Stove and range manufacturers still experience active business, seasonal influences so far having failed to curtail operations. Few large pig iron consumers have entered the market, still being protected by stocks. No. 2 foundry and malleable pig iron continue $18.50, furnace.

Boston — A hearing was held last week by the New England Freight association on a protest against proposed new storage charges on imported pig iron at Boston. Buying continues light with the larger consumers having ample stocks for this quarter. There has been but slight increase in foundry operations.

Philadelphia — The Conshohocken, Pa., stack has suspended operations, with no other merchant furnace blowing in this district. Pig iron releases have shown little perceptible improvement over the past week, and in no case has there been an important order.

Buffalo—Pig iron sales show substantial betterment. Several 500-ton lots have been sold for fourth quarter delivery and other tonnage of fair size is pending. Shipments in September were the best of any month of the quarter but still far below averages for the first half of the year.

Cincinnati — Pig iron sales continue restricted to carload lots. The low rate of melt has served to prolong the absence of important interests, who bought heavily in the second quarter. Quotations are firm. Little or no contracting for future needs is being done, but producers appear confident of improved business over the remainder of the year.

St. Louis—Spot purchasing of pig iron in this area has developed further noticeable improvement and shipments have also picked up substantially. Stove manufacturers report business good, and similar conditions exist in the farm implement industry.

Birmingham, Ala.—Prompt delivery is being made on all sales of pig iron by furnaces, single car lots predominating, and in almost every instance immediate delivery being required. Melters are adverse to carrying stock on yards.

Toronto, Ont. — General business in pig iron trade showed little change for the week. Melters are manifesting no interest in the market other than for spot needs. The daily melt is unchanged at around 35 per cent. Pig iron production, however, is running well ahead of that of last year, totaling around 35,000 tons per month with three stacks blowing.

Scrap

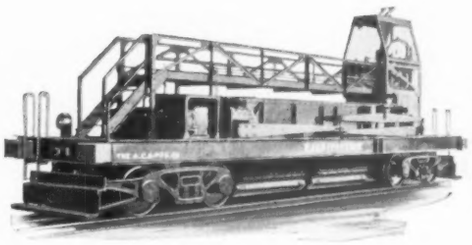
Scrap Prices, Page 67

Pittsburgh — Based on small purchases by a district independent, the local No. 1 heavy melting steel market eased off 50 cents a ton last week, and No. 1 heavy melting steel here is now $10 to $10.50, with hydraulic compressed sheets $10 to $10.50, and machine shop turnings $6.75 to $7.25. Scrap brokers are preparing to bid on October accumulations of leading railroads. Pennsylvania railroad closed Oct. 3; B. & O. will close Oct. 8; Norfolk & Western, Oct. 11, to mention several prominent lists.

Cleveland—Quotations on certain grades of old materials have been modified slightly by the larger handlers. Shipments to local consumers continued at a restricted volume.

Boston—Dealers still are paying

ATLAS SCALE CARS



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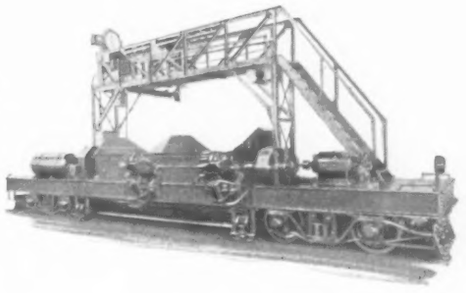

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CLEVELAND, OHIO

$7.50 and $6.50, dock, for No. 1 and 2 steel for export. Slightly over 4000 tons is being loading for Japan, and additional foreign business has been booked. Domestic buying is light, and delivered prices for melting steel grades about equal dealers' buying prices at Boston docks for export.

Chicago—Scrap prices are steady following the advance of 50 cents a ton in heavy melting steel a week ago. Corresponding increases have been recorded in prices bid on recent railroad lists, and the market has a fairly steady tone despite the lack of general interest on the part of mills in new buying. Shipments against old orders still are retarded by the low rate of open-hearth operations. Heavy melting steel continues $8.50 to $9, with prices on a few grades reflecting the higher level on the former material.

New York—Domestic buying continues sluggish, but export demand holds well, dealers paying $8 and $6.50, barge, for heavy melting steel grades. In a few isolated instances these prices have been bettered by 50 cents a ton, but this has not established the market.

Philadelphia—Scrap prices are largely unchanged, and nominal, with a slight revision in two of the more minor grades. The Pencoyd, Pa., consumer has withdrawn from the market for an indefinite period; little tonnage is being purchased elsewhere, and in some cases shipments continue held up against old contracts.

Buffalo—Activity in scrap has broadened rapidly although sales have been limited generally to smaller lots. A second mill has purchased No. 2 heavy melting steel at $8.75, contracting for 2000 tons or more.

Detroit—The market on important grades of open hearth scrap weakened 25 cents a ton last week and No. 1 heavy melting steel is now quoted $7.50 to $8. Hydraulic compressed sheets, No. 2 heavy melting steel, and both grades of busheling are down likewise. The market has been forced lower by the recent purchases of a local consumer, amounting to about 10,000 tons. It is reported that this buyer paid $8 for No. 1 heavy melting steel and $7 for No. 2 heavy melting steel.

Cincinnati—Principal melters remain out of the market, professing to have adequate material on hand for the immediate future. Quotations are weak and nominal.

St. Louis—Trading in scrap iron and steel continues light but sentiment is more optimistic and inquiries are increasing. The principal change in the situation has been increased offerings by railroads. The Cotton Belt is offering 50 carloads, and the Missouri, Kansas & Texas 2000 tons of specialties.

Birmingham, Ala.—With plenty of stock on hand, dealers in scrap iron and steel are awaiting a little improvement. While a longer spell of dullness has been experienced before, there is disappointment at present because of expectations for a steady year.

Toronto, Ont.—Trading in iron and steel scrap is dull. Consumers are taking supplies for spot needs only.

Semifinished

Semifinished Prices, Page 65

Strong demand from tin plate manufacturers features the semifinished steel market. Forging shops and wire rod users are restricting their buying. The recent slight flurry in skelp demand has subsided. For

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shipment over the balance of this quarter, producers are quoting sheet bars at $28, Pittsburgh; billets $27; and wire rods, $38.

Warehouse

Warehouse Prices, Page 68

Pittsburgh—A fairly steady demand is noted for steel products out of warehouses. Prices are unchanged.

Cleveland—Warehouse business has shown little deviation in tonnage for several weeks. Some sellers note a slight increase in the number of orders since Oct. 1.

Chicago—Sales have increased fairly rapidly during the past two weeks, and from previous experience forecast a betterment in demand during the first quarter of next year. Sales for the last two weeks of September were the largest since June in addition to exceeding those of the corresponding 1933 period.

New York—Warehouse volume the first week in October was slightly above the average of weekly totals for September. Demand is well spread, but mainly in small orders. This month is generally expected to bring gradual gains.

Philadelphia—Warehouse demand has been fairly well sustained since the first of the month. In some items used in building, seasonal improvement is noted. There has also been some buying out of warehouse by radio manufacturers.

Detroit—Warehouse orders continue at the better rate experienced in September. Business reflects increasing activity on the part of automotive equipment suppliers. Bolts and nuts have been reduced to 70 off list.

Cincinnati—Orders for steel from warehouse continue chiefly from industrial needs. Although somewhat more numerous than early in September, individual tonnage has not increased.

St. Louis—Sales of iron and steel from warehouse are fairly well maintained, improvement noted in late September being still in evidence. Reduced prices of nuts and bolts, according to two leading interests, have stimulated business to some extent.

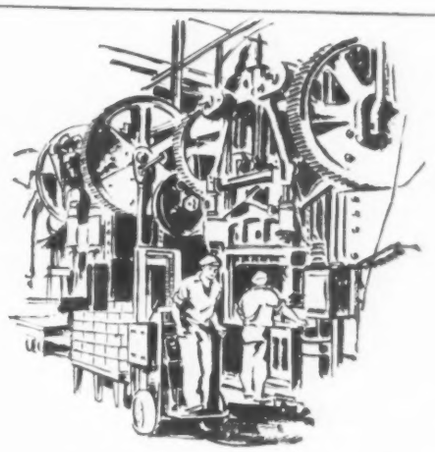
Nonferrous Metals

Nonferrous Metal Prices, Page 66, 67

New York—Fairly steady and active demand with prices firm to stronger for lead featured nonferrous metal markets last week. Foreign copper and zinc prices were easy with demand light. Tin prices were steady at a lower level.

Copper—Curtailment of domestic copper output through a plan to reduce sales quotas to meet current business conditions appears a virtual certainty. It is understood such a plan has been approved by the code authority but no official announcement has been made. While blue eagle prices remained unchanged on the basis of 9.00c, Connecticut, for electrolytic, foreign copper fell to new low levels around 6.35c, c.i.f. European ports.

Lead—St. Joseph Lead Co. advanced its prices $1 a ton on Monday to 3.65c, New York, and took in sufficient tonnages at the higher level to establish range prices for the metal. Consumers were well represented in the market and business booked totaled over two and one-half times that of the preceding week. Quota-



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tions at the end of the week were 3.60c to 3.65c, New York, and 3.45c to 3.50c, East St. Louis.

Zinc—Prime western prices were shaded with the result that the market has appeared weak and the immediate trend uncertain. Spot through December was quoted 3.87½c, East St. Louis, and 4.22½c, New York.

Tin—A stronger dollar against the pound sterling served to depress tin prices in the domestic market. Straits spot was quoted slightly below the 51-cent level throughout the week. Domestic deliveries for September amounted to 3850 tons against 4045 in August.

Antimony—Spot has moved up to 9.00c and over, duty paid, depending on quantity, due to higher prices reported in China.

Aluminum—Continued quiet and unchanged.

Steel in Europe

Foreign Steel Prices, Page 68

London—*(By Cable)*—Prospects for the last quarter of 1934 indicate a steady flow of production. Heavy sales of pig iron against specifications maintained price stability, and were a helpful factor in all departments of the iron and steel industry. The announcement of the proposal to build the sistership to the QUEEN MARY, will stimulate the shipbuilding industry. Reports on the Continent are that steelworks are assured of employment for some time.

British demand is quieter, but inquiries are maintained from Japan, China, and India. The domestic market on the Continent is slack. French output of steel is below the level of last year.

Pacific Coast

Pacific Coast Prices, Page 65, 66, 68

San Francisco—*(By Air Mail)*—Interest is centered in the opening of bids shortly for an aqueduct for the metropolitan water district, Los Angeles, requiring more than 44,000 tons of reinforcing bars, 6000 tons of plates, and 400 tons of structural shapes. This is the largest project that has developed on the Pacific coast this year and competition is expected to be keen.

The district, also will open bids Oct. 31, under specification No. 75, for an additional 30 miles of aqueduct, involving 8000 tons of bars and several thousands tons of plates and shapes.

Standard Oil Co., San Francisco, has awarded 3000 tons of plates for six 134,000-barrel tanks to the Consolidated Steel Corp., Los Angeles, and 1400 tons for five 134,000-barrel tanks to Western Pipe & Steel Co., San Francisco.

Bids have been taken on 1100 tons of reinforcing bars for a school in South San Francisco. Reinforcing bar business expected to be placed during the fourth quarter aggregates more than 80,000 tons.

Berkeley Steel Construction Co. took 100 tons of plates for two smokestacks for the Standard Oil Co., Richmond, Calif.

Structural shape lettings during the week were not particularly heavy, less than 1500 tons being reported placed. Consolidated Steel Corp. secured 220 tons for a bridge in Los Angeles county, California, and Minneapolis-Moline Power Implement Co., took 270 tons for a bridge in Utah, and 250 tons for a building at Selby, Calif. Unnamed interests secured 454 tons for bridges in Yellowstone and Silver Bow counties Montana, and 275 tons for a state crossing in Eagle county, Colorado. American Pipe & Steel Corp., Los Angeles, booked 290 tons of 22-inch No. 14 gage pipe for the metropolitan water district, Los Angeles, and 147 tons for Santa Monica, Calif. Oakland, Calif., will open bids Oct. 10 for 653 tons. Close to 7500 tons of high pressure pipe still is pending for San Francisco.

No. 1 heavy melting steel holds at $10.25, while No. 2 yard scrap is active at $8. Moore Drydock Co. is cutting up two battleships at its Oakland yards, the heavy armor plate bringing as high as $35 a ton.

Public Works Still Lead

Seattle—Public works projects still are the mainstay of industry in the Pacific Northwest. Private plants are buying little steel and iron.

Some small lots were placed in this territory during the week. The largest, 500 tons of reinforcing bars for the Skagit river power project, went to the Northwest Steel Rolling Mills Inc., Seattle. For the same project, Seattle opened bids Oct. 4 for 216 tons of angle steel for transmission towers.

Other awards included: 100 tons

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of reinforcing bars and 175 tons of shapes, placed respectively with Soule Steel Co., and Poole & McGonigle Co., Portland, Oreg., by the Ross B. Hammond Co., Portland, which has the general contract for the Washington State college power house, Pullman, Wash.

Washington has awarded the contract for a 200-foot steel span with steel girder approaches over the Wynoochee river, Grays Harbor county, to Sheble Construction Co., Seattle, at $81,209. This involves 270 tons of shapes and considerable reinforcing bars.

Western Construction Co., Seattle, has the contract at $19,884 for a 100-foot state concrete girder bridge in Lewis county, involving 33 tons of reinforcing.

Montana will receive bids Oct. 25 for 12 road projects, including a number of spans. W. A. O'Brien, Butte, Mont., is low at $86,439 for a 549-foot bridge, steel and concrete, over the Yellowstone river, and Fred B. Dudley, Great Falls, Mont., is low at $39,921, for a steel and concrete underpass near Butte.

The wholesale jobbing trade is limited to small lots out of stock, volume being below normal for this season. Price schedules are maintained.

Export movement of scrap is awaiting higher offers from the Orient to offset advanced ocean freight rates. Japanese buyers are in the market, but are unwilling to raise their c.i.f. prices.

NRA

(*Concluded from Page* 16)

rector of the Institute of Scrap Iron and Steel, and Gus Gillerman, representing the St. Louis chapter of the institute, supported the proposal. The nearby Illinois district would be included in Missouri.

At a hearing last week, Mr. Schwartz and Charles M. Haskin, secretary of the National Association of Waste Material Dealers, urged an amendment to the scrap code to permit all dealers to place themselves on the code wage basis instead of adhering to old PRA agreements.

CODE AUTHORITY MEMBERSHIPS

Corrugated rolled-metal culvert pipe industry: E. B. Abbett, Newport Culvert Co., Newport, Ky.; S. R. Ives, Armco Culvert Mfg. association, Middletown, O.; F. A. Kelly, Toncan Culvert association, care of Republic Steel Corp., Youngstown, O.; J. H. Robinson, Wheeling Corrugating Co., Wheeling, W. Va.; J. P. Dolan, Penn Culvert Co., Cambridge, Mass.

CODE BUDGETS SUBMITTED

For malleable iron industry, $89,404, from Dec. 7, 1933, to May 31, 1935; for abrasive grain industry, $6293, from June 1, 1934, to May 31, 1935.

Equipment

Pittsburgh—Last week the checking of what had been a slight advance in steelmaking operations in this district further served to quiet prospects in the steel mill equipment markets. Many equipment builders, one local shop in particular, continue to be active in computing costs of projected rolling mill, blast furnace and open-hearth changes but new inquiries with definite closing dates are scarce. Holdups continue to characterize the steel mill roll market. It is expected that the hot strip mill being installed at Detroit for the McClouth Steel Corp. will be turned over for the first time around Nov. 1. Originally, it had been planned to start this mill Oct. 1.

Cleveland—For installation in its general machine shop, Bethlehem Steel Co., Bethlehem, Pa., has ordered seven large turret lathes from a builder here. Although the order was placed a few weeks ago, shipment on the machines has not started. They are reported to be available from stock, with only a few minor changes required. Equipment builders appear to be uniformly of the opinion that indecision and vacillation at Washington are choking off new business which, for this month and last, has been unimpressive, brightened only by an occasional rush order for a single unit here and there.

Chicago—One of the largest liquidation programs carried out in this district started recently with the sale of equipment of the Grigsby-Grunow Co. A large number of metalworking and woodworking machines, in addition to enameling and plating equipment, were included in the sale. Most machine tools were fairly new. Machinery and equipment markets here show improvement in inquiries but sales remain light. September business in a number of instances was lighter than that of Au-

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gust, but the upturn in inquiries is expected to forecast a later expansion in orders. Machine tool buying is spotty and invariably involves only a few items at a time. Further improvement is noted in demand for small tools, however.

Ingersoll Milling Machine Co., Rockford, Ill., has been awarded two milling machines for the Washington navy yard at $24,925.

Boston—Demand for machine tools is dull, except for navy requirements, with buying limited to one or two units at a time by private industrial shops. Leland-Gifford Co., Worcester, Mass., is low on 13 drilling machines and a frequency changer for the navy, delivery Washington. Baldwin-Southwark Corp., Philadelphia, is low on a machine for tension-compression tests on metals and an automatic stress-strain recorder for Newport, R. I. Brown & Sharpe Mfg. Co., Providence, R. I., booked a milling machine for the Norfolk, Va., navy yard. A Torrington, Conn., lathe builder has taken part of the requirements for the Brooklyn, N. Y., technical school.

New York — About one-third of the machine tools for the Brooklyn Technical and Bronx Vocational schools have been placed by the board of education here. Purchases include more than 100 units thus far. Specifications are now being prepared at government arsenals for equipment to be purchased by the ordnance department, a proposed expenditure of more than $2,000,000. Bids on this machinery, which will include considerable heavy equipment, are expected out late next month. Private industrial inquiry and buying is light.

Construction and Enterprise

New England

WILLIMANTIC, CONN.—City is preparing plans for a filtration plant on Natchaug river, to cost approximately $50,000. N. S. Hill Jr., 112 East Nineteenth street, New York, engineer.

WILSON, CONN.—Warehouse and machine shop on Andrus Christensen property on Windsor road recently sustained damages by fire.

BOSTON—West & Dodge Thread Gauge Co. Inc. has been formed to manufacture textile mill equipment by Donald A. Cameron and Herbert A. Flint, 171 Camden street, Boston.

MILLINOCKET, ME.—Great Northern Paper Co. is planning to construct a power plant, to cost $80,000. H. J. Deutchbein Co., 350 Fifth avenue, New York, engineer.

New York

LOCKPORT, N. Y.—City, H. F. Thurston, mayor, will hold an election in November on bonds for municipal hydro-electric plant, to cost $908,000. L. A. Harding, Prudence building, Buffalo, is engineer.

NEW YORK—New York Central railroad, W. J. Pfau, chief engineer, 466 Lexington avenue, plans 21 x 44-foot water pumping station at West End avenue and Fifty-ninth street, to cost $28,000, with equipment.

NEW YORK—Peelle Co., Brooklyn, N. Y., is low at $328,000 on contract for installation of ventilating system on several sections of the Independent subway system in Brooklyn. Woodcrest Construction Co., New York, is low at $164,000 on drainage contract for several sections of the same system. Substantial tonnages of steel sheets, pipe, fans, blowers, motors, pumps and other materials are required in the two contracts.

NIAGARA FALLS, N. Y.—City is having plans prepared for a sewage disposal plant to cost $2,000,000.

NIAGARA FALLS, N. Y.—Walter S. Johnson Building Co., Niagara Falls, has been awarded contract to erect a large addition to the Niagara Falls plant of the Acheson Graphite Co.

SOMERS, N. Y.—New York State Electric & Gas Corp., Ithaca, N. Y., will build an electric power plant here, to exceed $28,500.

WELLSVILLE, N. Y.—Village is planning to build a new power house for its electric plant, to cost about $85,000.

Ohio

SANDUSKY, O.—Brown Clutch Co. is changing its name to Brown Industries Inc. and has an expansion program necessitated by increasing demand for its products in sugar-growing districts of Puerto Rico, Cuba, and the Philippines. Manufacture of contractors' equipment will be added, according to O. F. Rinderle, president.

New Jersey

JERSEY CITY, N. J.—Joseph T. Ryerson & Son Inc., 2558 West Sixteenth street, Chicago, is enlarging its warehouse here to provide additional space for fine and specialty steels.

TRENTON, N. J.—Thropp Foundry Co. has recently been incorporated by James W. Thropp.

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Co., Twelfth street near Monroe, is having a pre-cast concrete sectional building erected by Ernest Geiger Engineering & Mfg. Co., Irvington, N. J.

Pennsylvania

EAGLEROCK, PA.—Henry's Bend Community association, Henry's Bend (Eaglerock postoffice), D. C. Stubler, president, 23 Elm street, Oil City, Pa., plans electric light and power plant, to cost $28,500 or more.

ELLWOOD CITY, PA.—Ellwood City Consolidated Water Co. is receiving bids for an office and shop building, to cost approximately $30,000.

NEW CASTLE, PA.—At a recent formal session of the council, the mayor introduced a bill for the construction of a municipal electric plant.

Michigan

BENTON HARBOR, MICH.—Berrien Brewing Co., recently incorporated with capital stock of $150,000, has purchased plant of the Spencer-Barnes Furniture Co., which it will remodel into a brewery.

DETROIT—Bohn Aluminum & Brass Corp., 2512 East Grand boulevard, has plans for a $15,000,000 to $20,000,000 expansion program in Detroit as the result of discovery of a new process for the manufacture of aluminum, according to Charles B. Bohn, president. A $50,000 plant will be constructed immediately to perfect production operation. A sheet and wire mill will be erected, also a plant in Utah near ore deposits.

DEXTER, MICH.—Construction is under way on the plant of the Independent Gear & Tool Co., a new concern sponsored by Dexter business leaders.

GROSSE POINT SHORES, MICH.—Village is planning installation of an additional boiler and oil burner equipment in its municipal building.

IRONWOOD, MICH.—Marathon Paper Mills Co., owner of the former Scott & Howe sawmill, is making extensive repairs to the plant, preparatory to sawing lumber during the fall and winter months. Some new machinery and equipment will be installed.

MORENCI, MICH.—Village has PWA loan of $146,000 for erection of a power plant. G. C. Dailey, Morenci, Mich., is engineer.

Indiana

EVANSVILLE, IND.—Extensive alterations to facilitate production and smoother plant operation are under way at the plant of Servel Inc. Extension of the sheet metal department, sidings and changes in conveyor lines are among the changes to be made.

RICHMOND, IND.—City, W. B. Harris, mayor, is preparing plans and will take bids in October for sewage disposal plant to cost $500,000. C. Hurd, 1639 Architects building, Indianapolis, architect.

Illinois

CENTRALIA, ILL.—City will hold an election about Oct. 17 on proposal to construct municipal light and power plant, to cost $477,000. Baumes-McDevitt Co., 1871 Railway exchange building, St. Louis, engineer.

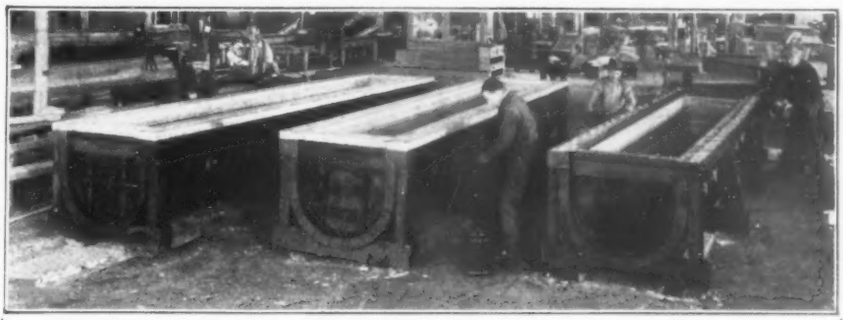
CHICAGO — Roseland Sheet Metal Works Inc., 1203 Emerald avenue, has been incorporated to operate a general sheet metal products manufacturing plant, by Otto Bark, Otto Bark Jr., and Hans Winzenze. Correspondent: James P. Christensen, 19 South LaSalle street.

FINDLAY, ILL.—Village board of trustees, H. D. Lutz, president, will receive bids Oct. 19 for construction of waterworks system, to cost $50,000. Warren & Van Praag, Milliken building, Decatur, Ill., engineers.

NAPERVILLE, ILL.—City plans alterations and additions to power generating plant, including electrical equipment, and two 500-horsepower diesel engines, to cost $80,700. Allen & Vogtborg, 205 West Wacker drive, Chicago, engineers.

GREENFIELD, ILL.—City council, G. N. Cole, mayor, will open bids Oct. 23 for waterworks, to cost $79,000. Warren & Van Praag, Milliken building, Decatur, Ill., engineers.

WAUKEGAN, ILL.—Alexian Brothers Hospital, care of Brother Gerard, provincial superior, 1200 Bladen avenue, Chicago, will receive bids in the spring for a 3 or 4-story building, power house and generating plant, to cost about



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$600,000. Maher & McGrew, 1564 Sherman avenue, Evanston, Ill., architects.

Alabama

MOUNDVILLE, ALA.—City will receive bids Oct. 18 for waterworks system, to cost $41,000. About 150 tons of cast iron pipe will be required.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids Oct. 9, schedule 3409, one gasoline engine driven air compressor, delivery Philadelphia; Oct. 12, schedule 3421, electric motors and controllers and spare parts.

Georgia

AUGUSTA, GA.—Augusta canal commission, A. Merry, chairman, is revising plans for hydroelectric plant to meet PWA allotment. New plan consists of both hydro and auxiliary combustion engine plants. Estimated cost $1,250,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., engineer.

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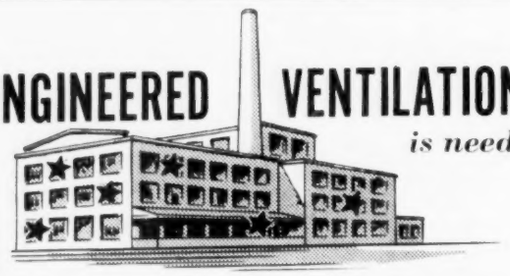

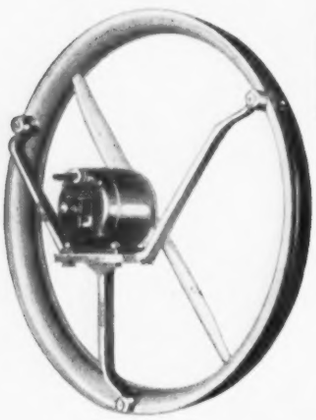

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Kentucky

EDDYSVILLE, KY.—Town council has fund of $40,000, and plans installing pumping machinery and auxiliary equipment, etc. J. S. Watkins, consulting engineer, Lexington, Ky.

Louisiana

RINGGOLD, LA.—City, C. E. Tomme, mayor, is planning $44,000 waterworks improvements, including erection of steel tank and tower.

SUNSET, LA.—City plans waterworks, including deep well and pump house. PWA loan of $29,000 has been approved. J. B. McCrary Co., engineer, Atlanta, Ga.

Maryland

BALTIMORE—Gas & Electric Co., Lexington building, plans a 2-story, 60 x 80 foot electric substation, to cost about $50,000. A. D. Loizeaux, Monument and Constitution streets, is engineer.

North Carolina

LEXINGTON, N. C.—North Eastern Construction Co., Winston-Salem, N. C., has contract at $85,000 for waterworks system.

Missouri

BLAND, MO.—City, D. S. Branson, mayor, will receive bids soon for $44,500 waterworks and $25,000 sewer system. George E. Wells Inc., 420 Security building, St. Louis, engineer.

ST. LOUIS—H. Sokolik Packing Co. is receiving bids for an addition to its plant at 1719 North Vandeventer, to cost about $45,000.

ST. LOUIS — Monsanto Chemical Works will erect a 1-story service building addition to its plant in Monsanto, Ill., across the Mississippi river from St. Louis. This is in addition to a 3-story office building now being built.

Arkansas

LITTLE ROCK, ARK.—Plough Inc., chemical manufacturer, is planning a new $350,000 manufacturing plant in Memphis, and expansion of its plant facilities in New York City at a cost of about $150,000.

SMACKOVER, ARK.—Greyhound Machine Works Inc. has been incorporated by O. F. Matthews and E. E. Bellar.

Texas

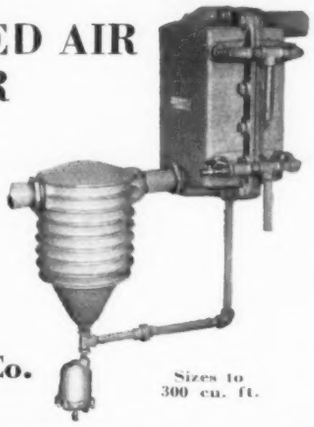
GRAFORD, TEX.—City, care of F. A. Jones, has submitted application for PWA loan and grant to finance waterworks improvements, including 50,000-gallon overhead tank, pumps and pump station. Cost is estimated at $35,000. Hawley, Freese & Nichols, Capps building, Fort Worth, Tex., engineers.

LINDALE, TEX.—City, M. H. York, mayor, will soon take bids on waterworks, including two 250-gallon per minute centrifugal pumps and motors, and 50,000-gallon steel tank on 100-foot steel tower, to cost $30,000. Montgomery & Ward, Harvey-Snider building, Wichita Falls, Tex., engineers.

Wisconsin

OSHKOSH, WIS.—United States Motors Corp. has plans under way to in-

COMPRESSED AIR DRYER



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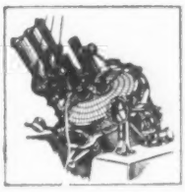

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Standard Sizes 25 lbs. to 100 Tons Capacity
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troduce a line of diesel-powered electric generating plants by the first of the year.

Minnesota

MINNEAPOLIS — Arrowhead Steel Products Co., manufacturer of pistons and wrist pins, closed since Sept. 10, has reopened its plant.

MINNEAPOLIS—B. P. Nelson Mfg. Co., manufacturer of asphalt shingles and paper boxes, has awarded contract for alterations to its factory, and construction of a metal warehouse.

North Dakota

DICKINSON, N. DAK.—Lehigh Briquetting Co., K. A. Loven, general manager, has received approval of a $400,000 loan from RFC to be used for new equipment, and working capital for the plant near Dickinson.

South Dakota

DEADWOOD, S. DAK.—Rushmore Brewing Co. has been incorporated with $153,000 capital to operate a brewery, by F. R. Barthold, Louis Johnson and A. H. Markert. Work on the proposed brewery is expected to be started late this fall.

LEAD, S. DAK.—Homestake Mining Co. is building a stamp mill addition, 96 x 153 feet, to cost $250,000, which will house 60 new 1550-pound stamps. It will increase the capacity of the stamp mill by 1900 tons of ore per 24 hours. The new addition will also house three 6 x 12 foot rod mills, two bowl classifiers, two 5 x 14 foot ball mills, five classifiers, five amalgamators and three dewatering cones.

Iowa

CRESTON, IOWA—City council will hold election soon on $185,000 bonds for purchasing local waterworks system of Taxpayers Municipal Water Co., and will improve plant, if purchased, by expending an additional $40,000 for deep well, pumps, main extensions, etc.

DUBUQUE, IOWA—Dubuque Packing Co., George Hess, secretary, will soon start construction of a 100 x 120 foot addition to the packing plant, to cost $100,000.

Nebraska

ASHLAND, NEBR.—City council awarded general contract for construction of manganese and iron removal plant to Ernest Rokahr & Son, Lincoln, Nebr. Contracts for filtration plant and pumps will be awarded soon.

Montana

NASHUA, MONT.—City plans constructing water distributing system, including well, pump and steel tank on steel tower, to cost about $25,000. PWA loan has been applied for. E. Sandquist, Havre, Mont., and C. Farmer, Helena, Mont., are engineers.

Pacific Coast

BURLINGAME, CALIF.—Voters have approved $86,000 bond issue to secure PWA loan and grant of $147,000 for construction of sewage disposal plant.

CLARKSBURG, CALIF.—Construction is under way on shop building for the Clarksburg Union high school. H. J. Devine, California State Life building, Sacramento, Calif., architect.

LODI, CALIF.—Monarch Winery is planning construction of a plant. Equipment will also be purchased. Leo Starr, manager of construction.

LOS ANGELES—W. H. Jahns, of Jahns Quality Piston Inc., 2660 Lacy, has taken over the entire piston plant of Motor Products Mfg. Corp. and will build special pistons for all types of aircraft, diesel and stationary engines, trucks, tractors, etc. Complete piston and sleeve assemblies for diesel-powered equipment will be manufactured.

STOCKTON, CALIF.—Pacific Can Co., subsidiary of Wheeling Steel Corp., Wheeling, W. Va., is planning to build a plant here soon. E. F. Euphrat is Pacific coast manager. Two large canning factories are to be built on the site adjoining the plant, these to be operated by independent packers.

PORTLAND, OREG.—Allis Chalmers Mfg. Co. recently sustained damages by fire at its east side plant. The greatest damage was to the stock, including tractors, combine harvesters, motors, shifting and other equipment.

TACOMA, WASH.—Plants of the Tacoma Planing Mill and Pacific Millwork Co. were recently damaged by fire. Rebuilding plans have not been announced.

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AIR COMPRESSOR—170 cu. ft. 8-1/2 x 9" WORTHINGTON belt driven Air Compressor. Feather valves, receiver and belt. 100 lb. air pressure.

BENDING ROLLS—10' 2" BELOIT Plate Bending Rolls, pyramid type. Cap. 1-4" plate full length of rolls. Drop end housing. Driven by 7-1/2 H.P., 440 V., 3 ph., 60 cy. motor.

BORING MILL—BETTS 10' Vertical Boring Mill. Two swivel heads, 20 H.P., and 5 H.P. motors.

CORRUGATING ROLL—12' POORMAN Corrugating Roll. Belt or motor drive. Rolls 24" dia. Designed for interchangeable dies. Now fitted with die plates with 1-1/4" centers and 2-1/2" centers. Approx. wgt. 50,000 lbs.

CRANE—15 Ton ERIE Overhead Electric Traveling Crane. 62' span. 25' Lift, (3) motors, 220 v., 3 ph., 60 cy., A.C.

DRILL—5' CINCINNATI-BICKFORD Radial Drill. Motor drive with A.C. motor and starter.

FORGING MACHINE—2" Steel Frame, Single Geared, AJAX Forging Machine. Arranged for belt or motor drive.

GRINDERS—156" HYDE PARK Shear Knife Grinder. Grinding wheel 26" diameter sectional. Circulating Pump. Direct connected motor drive. Power feed and traverse.

KELLER—R-6 UNIVERSAL Radius and Cutter Grinder.

HEADER—No. 2 MANVILLE Rod Heading machine. Single stroke. Open die cold header. Cap. 5 16" x 4". Approx. wgt. 6525 lbs.

LATHES—No. 3 NILES-BEMENT-POND Geared Motor Drive Axle Lathe with A.C. motor, 30" Swing, 14' Bed.
26" x 16' BRIDGEFORD, Geared Head. Single Pulley drive with taper attachment.

PLANER—96" x 96" x 14' POND Four Head Heavy Duty, 50 H.P. motor drive.

PUNCH—12' BERTSCH Multiple or Gang Punch. Cap. 73-3/8" holes through No. 10 gauge plate on 2" centers. 25 strokes per minute. Will take up to 9 16" punches and dies. Length of stroke 3". Depth of Throat 7".

PRESSES—300 Ton NILES-BEMENT-POND Hydraulic WHEEL PRESS. 48" bet. parallel bars with Triplex Pump.

No. 12 BLISS STRAIGHT SIDE Double Crank, Double Geared, Single Action. 14" stroke. Bed area 52 x 84". Shaft dia. 12" at bearings, 13" at pins. Arr. for M.D. and motor adjustment. Wgt. 200,000 lbs.

No. 6-1/2 BLISS STRAIGHT Side Press. 54" bet. uprights. Dbl. Crank with spring counterbalance for slide. Stroke 8". Shaft 6-1/2" dia. at cranks, 7-1/2" dia. at pins. Approx. wgt. 33,500 lbs.

SHAPER—32" COLUMBIA Heavy Duty Crank Shaper, back geared arranged for motor drive, quick change gear speed box, swivel vise on table with jaws 16" wide. Hole under ram for key seating.

SHEAR—10' OHL Power Squaring Shear with brackets, gauge and all regular accessory parts for a complete machine. Cap. 3-16".

No. 10 BUFFALO Armor Plate Special Bar Cutter for cutting bars and shearing plates and shapes. Cap. Rounds 3-7 8", Squares, 3-1 2", angles, 8" x 3 4". Flats 8" x 1-1 4". Tees, 6" x 3 4". Channels 12"—25 lbs. Wgt. 16,500 lbs. MD.

5—12' 6" HYDE PARK Power Squaring Shears, motor drive with or without motors 16" gap. Cap. to shear 1-4", 5-16", and 3 8" plate, table 23" wide, 14' 3" long. Extra set of shear blades with each machine.

SLITTER—36" YODER Size G—Gang Slitting and Levelling machine, belt or motor drive. Cap. 15 cuts up to No. 16 gauge, 11 cuts—No. 14 gauge, 5 sets of cutters. Wgt. 5,000 lbs.

STRAIGHTENER AND CUTTING OFF MACHINE—No. 1 SHUSTER for strip metal, now equipped with rolls and tool for strip metal 1-1 4" wide by 1 8" thick. Driven by a 5 H.P., 220 v., 60 cy., 3 ph., A.C. motor.

TESTING MACHINE—150,000 lb. TINIUS OLSEN UNIVERSAL Screw Power Testing machine. Three rotating screw type. Belt or motor drive. Dial vernier screw beam. Complete set of grips.

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